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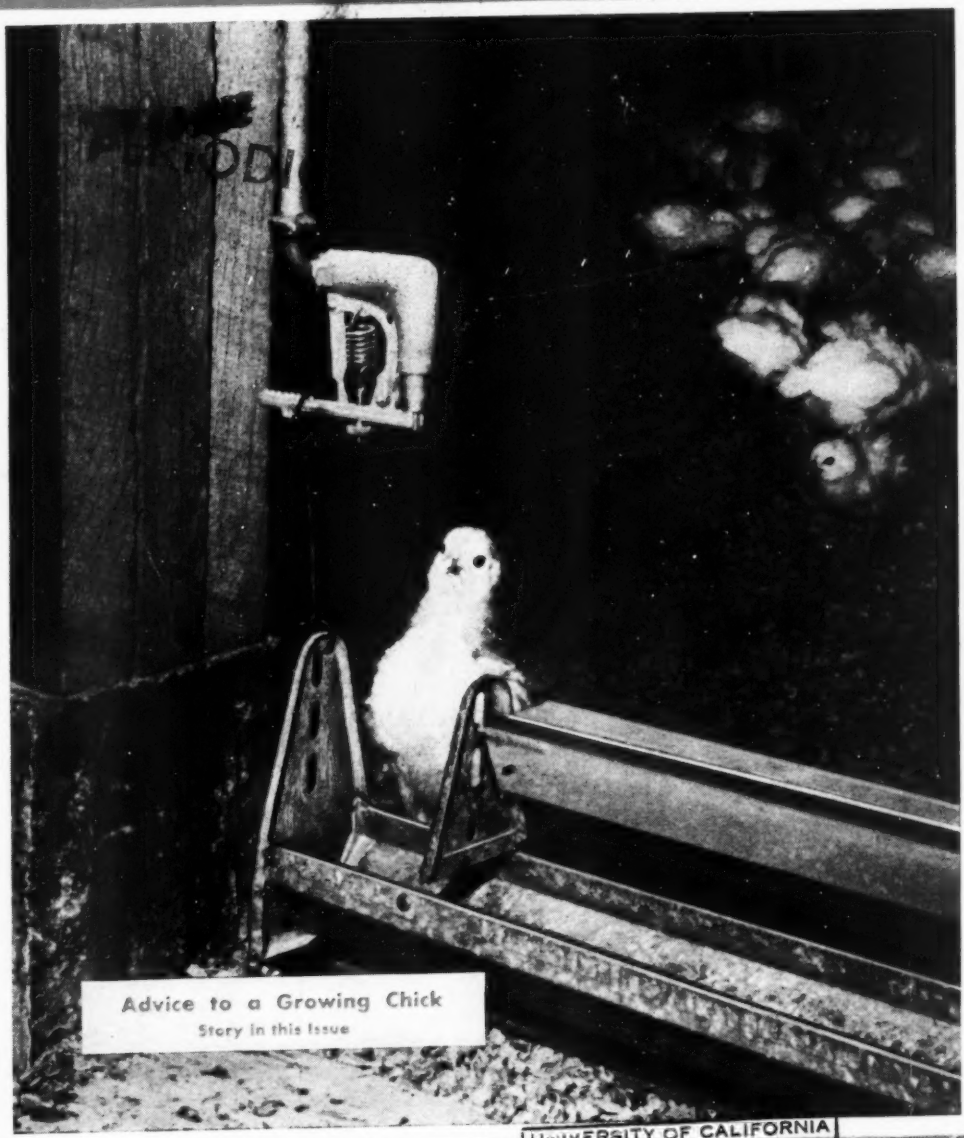
ELECTRICITY ON THE FARM Magazine

JANUARY, 1953

Mercury Tends the Brooder . . .
Moth Traps Save Tobacco . . .
Vacuum Cleaners are Versatile
Nights, Lights Affect Plants . . .
Equipment Buying Guide . . .

26th Year



Advice to a Growing Chick
Story in this Issue

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Ask for G-E Motors and Control on all Electrified Farm Equipment you buy!

GENERAL ELECTRIC FarmNews

Ask for G-E Motors and Control on all Electrified Farm Equipment you buy!

MORE POWER TO THE AMERICAN FARMER through more electricity on the farm

CROP DRIER BEATS WEATHER...SAVES GRAIN

VT. FARMERS FIND ELECTRIC VENTILATION PAYS OFF

Milk and egg yields are increased, farm building rot is checked

Robert O. Williams, manager of Mrs. J. H. Huyck's poultry farm at Wells, Vt. finds egg production is excellent since two electric powered ventilating fans were installed.

His hen house is cleaner-smelling, and he doesn't need to change the litter nearly as often. Structure-rotting moisture and ammonia are almost eliminated.

Power for the two fans is provided by G-E motors. Check "Poultry-House Ventilators" on the coupon for more information.

Dairy herd produces more milk

"Some of the best money we ever spent," say Leland and Edward Congdon, Clarendon, Vermont, of the two-fan ventilating system they installed in their dairy barn.

Their 60 head of cows and calves stay healthier because humidity is kept lower and sudden changes in temperature are reduced. Milk production is increased because cows eat more and drink more. Rot, which was destroying the hay chutes has been checked.

The ventilating fans are equipped with G-E motors for quiet, dependable operation. For more information, check "Electric Ventilator" on the coupon.

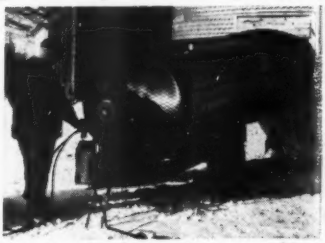
Heated-air drying lets farmers harvest early... lowers crop losses, brings in top market prices

"Thanks to the drier, my income will increase by at least $1300," reports Mr. Clare Backus of Route #1, Charlotte, Mich., who recently leased a modern, portable crop drier. "My first 800-bu. crib brought in $1350. That was a premium price, because the corn was early and because the cob was bone-dry. I will get at least that much for the second 800-bu. I dried."

Saves half of his corn crop

"By using the crop drier, I saved half my corn crop this year," continues Mr. Backus. "The second crib would have spoiled if I had waited for the old-fashioned natural air drying process. Despite damp weather, the drying process took less than 50 hours."

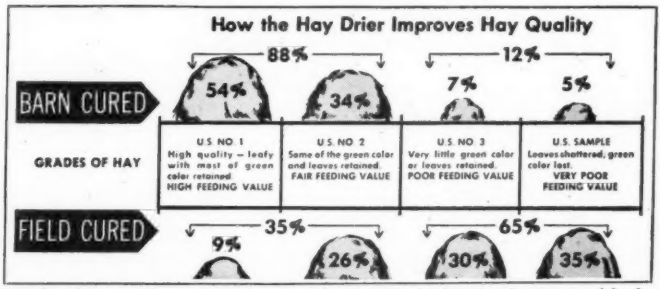
Mr. Backus saves other ways too.



Clare Backus adjusts valve on crop drier.

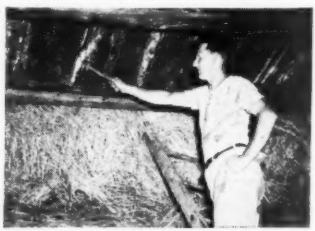
To get the complete story on how to beat the weather, save grain and increase your income, check "Crop Drier" on the coupon below.

To assure dependable, automatic drier operation, the manufacturer selected a 5-hp General Electric motor, and G-E controls.



Barn haydrying with crop drier improves hay quality by keeping it green and leafy.

Manager Williams adjusts back-draft damper to protect hens from draft. A thermostat keeps temperatures even for him.



Congdon points out how rat, which was destroying the hay chutes, has been practically eliminated by moisture-reducing ventilating fans.

General Electric Company
Section 671-24A, Schenectady 5, N. Y.

I would like additional information on the following equipment.

- ☐ Crop Drier ☐ Dairy Barn Ventilator
- ☐ Poultry-House Ventilator
- ☐ How to choose Your Motor

NAME_____

ADDRESS_____

CITY_____ STATE_____

Editor's Chat

ABOUT YOU—FOR YOU

When it comes to making plans, the job in essence is very simple for us. That's because we have only one purpose in mind when we include an article in one of our issues. It *must* contain information on some electrical use that will be helpful to you in your farming program. We are glad to say that most of our articles tell how your fellow farmers are utilizing electric service. That is, as it should be. We blend in with these experience reports the results of research and pertinent information about electrical products from manufacturers.

Frankly, we are very pleased with your response to the experience reports we've brought you last year. It's hard to point out those that made the "Hit Parade" without giving you a little information about them. Suppose we take a gander at a few.

With two conveyors and an elevator, Fred Ham of Milbrook, N. Y. eliminated all manual lifting in filling his hay mow. He put up 90 tons of hay with only 62 kilowatt hours—Lester Shook of Sebastopol Falls, Calif. let a conveyor feed his beef cattle—Earl DeBolt, Knox County, Ohio never touches his corn from the time it leaves the field until it is fed to the hogs as ground feed. His unique arrangement for handling eliminates most of the manual labor.

If you have a 24 cow herd the Agricultural Research folks at the University of Wisconsin said that you can save from 110 to 120 hours of labor each year with a barn cleaner.

Large feed grinding units just aren't justified in many cases. A combination crusher and hammermill developed at Kansas State College can process the necessary feed for a 100 beef cattle herd with only one or two hours of daily operation. The cost including depreciation and so forth does not run more than 50c per 1,000 lbs. of ground feed.

George Coover of Linglestown, Pa. solved his milkhouse heating problem with a unit consisting of six infrared lamps. He built it himself for $6. For one typical month the unit used only 16 kilowatt hours. An average of two pigs per litter was saved with the use of infrared lamps by Ulmer Elrod of Etowah County, Alabama.

Lowell Carter who lives near Ansonia, Ohio with the help of electrical equipment takes care of a 40 cow dairy herd all by himself.

Silos can be filled with a vertical elevator powered by a 5 HP motor at a comparable rate with a blower powered by a two plow tractor. This was reported by Pennsylvania State College. A 36' silo was filled by the vertical elevator with corn silage at the rate of more than 23 tons per hour.

Another successful method of heating milkhouses is gaining popularity in Wisconsin. This method utilizes the electric water heater. More than 100 farmers in northeastern Wisconsin did both jobs (heating water and milkhouse) for a 5 months period for an average of $26.37.

Ventilation saves in a tobacco curing barn according to a report from the Virginia Agricultural Experiment Station. 40 to 50 percent more tobacco can be cured in a ventilated barn. Thus the cost per pound for curing can be reduced as much as 57%.

The School of Home Economics at Purdue University reported that a washer, ironer, range, water system, vacuum cleaner, iron and refrigerator combined, can save you 75 days of labor during the year.

Arthur Wall of Andrew County, Missouri made a detailed analysis on his stock watering problem. Compared to his old oil heater which used 4 gallons of fuel a day, his electrical waterer averaged only 3.56 kilowatt hours, and for the entire season, only 324 kilowatt hours. In addition to this saving he cut his chore time considerably. Neither does he have to worry about the old oil tank heater going out on a windy night nor the fire hazard that existed.

William O. Bussey of Severn, Md. waxes his sweet potatoes and increases their value by as much as a dollar a bushel. He uses a machine that processes 150 bushels an hour. He plans to use it for waxing peppers and cucumbers too.

"I figure I get paid back more than five dollars for every dollar I spend for electricity to irrigate my alfalfa field and my pasture," says L. L. Welch of Villah, Washington. He uses a 5 HP electric motor to irrigate 15 acres of alfalfa and he has a 3 HP electric motor to irrigate 10 acres of pasture.

Perry McDonald of Noblesville, Ind. has no doubt as to the value of night lighting for hogs to get faster growth. His theory as to the reason for the faster gains was the fact that they loafed in the shade during the hot days and did 90% of their feeding at night.

You will probably recall many of the articles mentioned here. During the coming year we want to bring you more of the same. Your comments are always welcome.

A BUYING GUIDE

You will find a buying guide in the back of this issue. We hope that you will find it useful when looking for different pieces of electrical equipment. We are also preparing a 1952 editorial index. If you would like a copy, drop us a card.

Jim Ridout

ELECTRICITY ON THE FARM *Magazine*

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Moth Traps Save Tobacco

Two Years of Farm Use Prove That Crop Damage, by Worms, Can be Drastically Reduced

The peculiar reaction of certain night-flying insects to sources of radiant energy (light) is not new. This phenomenon was recognized years ago. Efforts were started in 1933 to capitalize on this weakness in nature. The initial result did nothing more than to indicate possibilities as there was a limit on the availability of specialized light sources most attractive to insects. In recent years, a special fluorescent tube has been developed that will attract certain species of night-flying insects exceptionally well. This special tube is called the black light fluorescent tube. It is rich in invisible light and emits but a very small percentage of what we know as visible light. One of the insects which is known to be attracted by this light is the hawk or tobacco hornworm moth.

After the development of this particular type of light, the next problem was to design a unit or trap that would catch the moth after it was attracted to the light. Two years of intensive research on trap design were conducted by the experimental stations at Purdue University, Iowa State College and the North Carolina Tobacco Experimental Station. At the end of the second year, a satisfactory trap had been developed.

The trap used in this experimental work for controlling the tobacco hornworm moth was about forty inches long and twenty-four inches wide. The top of the trap had a panel mounted immediately in the top of the trough. This does the work. The moth's flight is interrupted by the solid panel and the moth falls into the trough.

In the lower half of the trough. there was a throat narrowed to about six inches in which a baffle was placed that kept the insects from escaping after they fell down into the trough. The container on the bottom of the bag that retained the trapped insects was made of a vinyl plastic screen netting. The energy source used in this trap was two thirty watt black light fluorescent tubes. The panel, mounted at the top of the trap, was coated

Above: "Before using the traps, we had worm damage as high as 75%. With the traps, our damage was less than 1%. I believe if every farmer in Franklin County would put up a trap, turn it on, in five years we wouldn't have any tobacco worms. This morning I went out of my field, which is under the lights, to my neighbor's field which isn't under the lights and we found a lot of worms in his field. There was all the difference in the world. I would hate to do without the trap. I think it helped control certain other insects too." That's the opinion of Raymond Tyree, Franklin County, Virginia (right) expressed to A. J. Lambert, rural representative for Appalachian Electric Power Co. **Right:** Dr. C. Franklin Bishop (right), West Virginia Extension Plant Pathologist and Entomologist; and Lincoln County Extension Agent, John Shoulders inspect and classify moths from one of the traps. There certainly is a wide variety.

with a particular shade of green that, through experiments, has been shown to have characteristics which apparently blind this board to the insect. It was found that this material was also blinding to bats. A great number of them were caught in the experimental traps. This tends to disprove the old theory that bats would never fly into anything.

In the development of the trap, a great many different colors of fluorescing paints and mixtures of colors were tried out. But the only color that was satisfactory was the particular shade of green used on these traps. Insects had a tendency to roost on the trap when other colors were used. They would also roost on the crop immediately adjacent to the trap.

Next came the job of testing this trap on farms. Thirty traps were placed in tobacco fields the first year. They were placed in a variety of locations —some immediately in the tobacco, others on hills far removed from the crop, and still others surrounding a mile square area of the tobacco. By the end of the 1951 season, after accurate and exhaustive checks had been made of the areas where traps were used, it was evident that, where traps were properly placed in relation to the tobacco, exceptionally encouraging results were obtained. Damage by the tobacco hornworm was held to a minimum.

To find out if this was an accident, or due to certain local conditions, it was decided in 1952 to expand this activity over a wide area so that all variables that exist in tobacco growing could be met. Traps were placed from Macon, Georgia, south to the Florida line; diagonally through both South and North Carolina; in Franklin County Virginia; and in the southwest section of Virginia centering around Griffithsville.

J. F. Miller (left) Wayne County, West Virginia, tells W. A. Pohlman, representative of the trap manufacturer, "Our worm damage was less than 1%. You couldn't take my trap away."

The results obtained in 1952 paralleled almost one hundred per cent the results of 1951. This confirmed previous findings, that if the trap was placed in proper relation to the tobacco acreage, an exceptional degree of control of worm damage could be accorded that tobacco. Those that were in charge of this research work do not claim that one hundred per cent control of the worm problem can be obtained with light traps. They do claim, however, that where these traps were used the financial loss from worm damage ceased to be a serious problem.

Field experience indicates that where the tobacco plant is in view of the fluorescent tube, it has a very good chance of being protected. To insure adequate coverage it is recommended that traps be placed so as not to exceed ¼ mile from the farthest plant of tobacco, provided the plants are not shielded from view of the trap tube by hills, wooded areas, and so forth.

Here are some of the advantages that the experimenters think would come as a result of using these light traps:

1. Reduce labor requirements for producing tobacco.
2. Greatly reduce the cost of insect control.
3. Eliminate all or part of the need for insecticidal dust and sprays in tobacco insect control.
4. Eliminate weather hazards encountered in present control methods.
5. Eliminate or reduce the possibility of harm or injury to humans or animals in the control of insects.
6. Eliminate or reduce insecticide residues that may prove harmful or undesirable from the standpoint of tobacco products.

Data indicates that black light traps are most effective in rainy weather when it is most difficult to kill worms with dust or sprays.

On large tobacco farms the trap has proved quite desirable as an early indicator of moth flight in order that other fields or locations may be properly attended.

The farmers actually using the black light traps all appreciate that a *trapped* moth's egg laying is over. No eggs mean no worms and more tobacco goes to market, resulting in more money in their pockets.

Dr. T. E. Hienton, Head, Div. of Farm Electrification Research, USDA, (right) gets the story direct from Pete Woody, Franklin County Tobacco Farmer. Mr. Woody has 12.6 acres of tobacco and uses three traps. He says, "I think the trap is mighty fine. I think enough of it to want a trap in each field next year and would recommend the use of black light traps to other tobacco growers."

Chernoff's Cow Cafeteria

Silo Unloader and Conveyor Feed Silage, Cows Help Selves to Hay, Then Go to the Parlor for Milking

By WILLIAM GILMAN

How much time do you spend forking and toting feed to your cows, moving bedding in and manure out, trundling back and forth to the milk room—too much? Well then, let's visit David Chernoff's new push-button barn layout to see the ways he has licked chore problems.

Actually, so many other "York State" farmers have been driving over to Chernoff's place at Sangerfield, Oneida County, that he's been kept pretty busy just showing them around. It's been going on ever since he rebuilt after his old labor hog of a barn burned down in the summer of '51. But being human, he's proud to show the place, and time is certainly easy to spare.

Above: When David Chernoff throws this switch, both the silage unloader and the conveyor start moving. When feeding is finished, reversing switch, at right, is used to draw belt back under the platform. As the belt travels over the idler pulley, it cleans itself.

Right: Silage dumped from silo, outside wall at right, by automatic unloader drops through chute on to this conveyor belt. Cows line up along the 106-foot-long cafeteria in a drive-through feeding alley cleaned by tractor once daily. By facing the other way in alley, cows have access to hay direct from mow.

Even when the hired man was away, Chernoff could run two dozen cows through his home-made milking parlor in 45 minutes. With more milkers now, two men handle 51 in 75 minutes.

"Total chore time is less than a third what it was," Chernoff figures, "and about half what it would be if I'd rebuilt with a conventional barn equipped with labor-savers like gutter cleaner and silage unloader."

His construction costs were also way down. There were some savings in equipment he bought at discount, but other economies were more important. Pole-type construction is cheap and that's what he used. The buildings, a total of three, form a large "U". There is a 52′ x 104′ "bedroom" on one side, and a 44′ x 117′ "cafeteria" on the other. A conventional 26′ x 50′ production building, which houses the milking parlor, closes the end of the "U".

"I've found frills don't produce more milk," says Chernoff. "What's needed is weather protection for the herd, bedding, and feed—and that's what I've got under 24-gauge galvanized roofing."

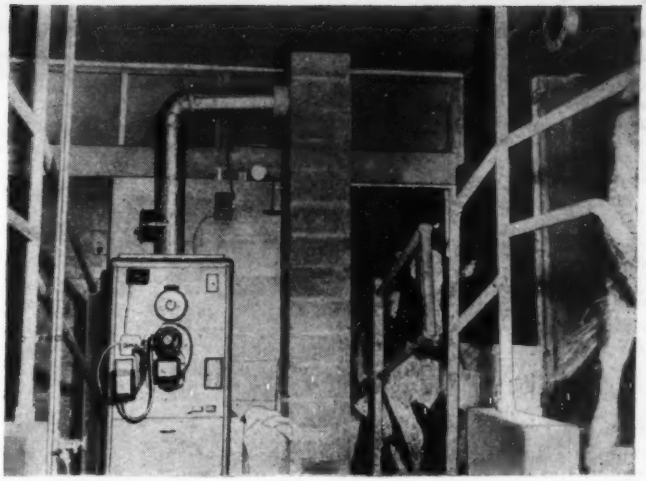
Construction Costs Held Down

Using home-grown timber saved $2,000. Hemlock poles, off the place, were buried 4½ feet deep and received ground-line preservative treatment costing 40 cents a pole. The milking parlor that does away with such things as stanchions and gutter cleaner was another big money-saver. Inside the U is a 50′ x 104′ exercise yard.

When Chernoff was considering a mechanized, conventional barn big enough to hold the 72 milkers he can now handle, the cost made him shudder. Estimates ran around $40,000. The setup he built and equipped ran way under half that.

Actual money paid out was $15,300, including such things as buildings, milking machines, cooler, milk pipeline, silage unloader, and furnace. Only thing not included is the silage self-feeding bunk, which would add around $700 cost—$100 for the motor furnished as a demonstrator; $300 for the conveyor belt furnished on a one-year-trial basis; the rest for switching controls, etc. Another $1,000—making a grand total of around $17,000—can be figured for concrete paving the feeding alley and exercise yard to insure them against becoming muddy during wet seasons.

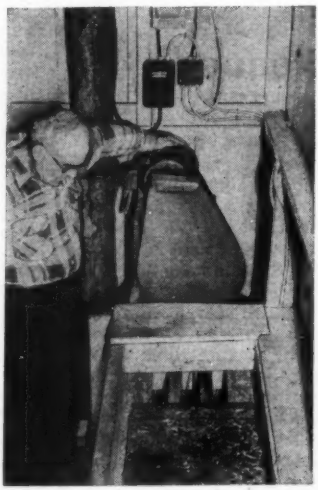
The thing that hits visitors' eyes first is the feeder barn. Cows en-



Chernoff's cows enter parlor tandem-fashion, walking up concrete ramp into four, chute-type, stalls on each side. When these at right have been prepared for milking, another four will come up other side. Door, right, leads into milkroom. Electrically-operated, automatic oil furnace warms both rooms in winter. Through ducts, it also sends warmth to calf pens in rear.

tering from the yard line up along a 15′ wide alley to eat silage off a 106′ long conveyor. This runs down along the wall from the 16′ x 48′ corn-filled cement silo which contains an automatic unloader run by a 3 hp motor. The switch for the unloader motor starts the synchronized conveyor and silage drops onto the belt from a silo chute.

This conveyor is a rubber-belt type adapted from a gutter cleaner. It is pulled by ¾-inch steel cable operated by a 1 hp motor at the far end. In 12 minutes, cows can feed anywhere off the entire belt. Its motor is reversible which allows self-cleaning. A rubber-covered nylon cable takes the belt back under the conveyor platform after the cows are fed.



Here's the end of the automatic silage feeding line. David Chernoff's father, William, has hand on reversible 1 hp motor that operates the conveyor belt. When the end of the belt reaches the motor, the cows have a 106-feet-long silage table to eat from. The motor is started simultaneously with the silage unloader. Starting switches for both are at the silo near the other end of the conveyor. The loaded belt is drawn by a steel cable. After feeding, the belt is drawn back underneath the conveyor platform by a rubber-covered nylon cable.

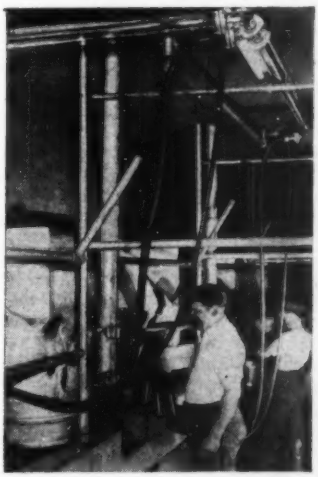
From this all-electric cafeteria, cows get silage. For hay, they simply turn around in the aisle and get it directly through side openings into two hay mows. Except for alleys and the 2′ wide conveyor, the entire building is hay space from the ground up. Chernoff simply rolls bales down to cows and opens them.

At milking time, cows move along, tandem-fashion, up four concrete steps into the 12′ x 50′ parlor. Eight of them stand, four on each side of a 30″ deep concrete pit that eliminates stooping. After milking, they exit at the rear.

Chernoff figures he saved $1,000 by using old 1¼-inch pipe and building his own chute-type stalls with gates, front and rear, that let cows pass straight through. The drop gates are operated from the pit. So are the grain buckets—converted foot washtubs—which swing into the stalls. There's a 3,000-bushel granary overhead and each cow gets her ration through a 3½-inch galvanized chute pipe with a home-made self-measuring gauge at its lower end.

Milk is moved combine method through a pyrex glass pipeline directly into cans in the milkroom. There, they slide into a side-loading cooler that Chernoff has become mighty fond of—no more can hoisting, no more soaked clothes. And with pipeline milking washup chores are easier.

Between the steps up into the parlor there was room for a thermostat-controlled oil-burning furnace. This provides heat for the milking parlor and adjoining 14′ x 17′ milkroom. It also sends warm air through ducts to the rear of the building where Cher-



Milking parlor chores are handled easily from this pit by David Chernoff, left, and hired man. Milk pipeline leading left to milkroom is overhead. While four cows on one side of pit are being milked the cows on opposite side of pit are released to allow the next lot to enter the milking stations.

From milking parlor, David Chernoff's milk goes by pipeline direct into cans in adjoining milkroom. Here, he slides them into side-loading cooler which eliminates back-breaking labor and soaked clothes.

noff has his bull and maternity pens.

"I've heard some veterinarians who criticized pen stabling," he says, "because they had to waste so much time catching animals. This way, I can have a tied-up cow waiting for the vet."

Straw bedding for the pen stable is handy and along the north wall for winter insulation. Chernoff throws out a fresh layer every day. Bedding and manure accumulate for a cleanout once a year, with his tractor's manure loader doing the labor.

The other cleaning is tractorized too. In the exercise yard, manure is pushed out every few days, depending on weather. In the feeder barn, drive-through doors allow the tractor scoop to push manure out daily into the waiting spreader. And this spreader also distributes fresh sawdust.

After the fire, Chernoff's county agent hesitated on what to recommend. He preferred a conventional barn, but added, "I can't see you going in debt for a $40,000 barn."

So they went to the State Fair, saw the pen-type exhibit there. Chernoff commented, "Not bad, eh?" and the agent nodded, "No, not bad."

Chernoff did a lot of scouting for other practical ideas he might incorporate, and took the plunge, hoping all the push-button methods would work out. Now, he says, "I should have done it long ago."

Even his electric bill turned out to be a pleasant surprise. It runs, at most, around $12 a month, and Chernoff asks, "How many hired men can you get for that?"

Mr. Veley Likes His Barn Cleaner

Most Tedious and Thankless Job Eliminated

Mr. Morris W. Veley of Richmondville in Schoharie County, New York, sent us the following letter and picture taken on his farm by his 11 year old son. We think you'll be interested in his experience with his barn cleaner.

"My barn cleaner is a commercial unit of the endless chain type which I installed myself. To it I added the 57′ elevator shown in the picture. The outer end of it is 24′ above the ground. The elevator is supported by a truss rod at the top, a short standard by the silo, and the two heavy pipe standards set in a concrete base at the outer end. I have ample room to drive under it by the silo with loads of grass for the silo or with the tractor and spreader.

"I have entirely eliminated one of the most tedious and thankless jobs on my farm. If I desire to stack the manure at times when it is difficult to draw, or when I am otherwise busy, I can let it go over the end of the elevator in a stack just by flipping a switch. Due to the elevator's length, the stack is the required distance from the barn, inaccessible to the cows, and meets all the Board of Health requirements. Any time I desire to draw the manure direct to the field I can open a simple trap door right next to the silo and let the manure fall directly in the spreader.

Here is the elevator that carries manure from the barn cleaner and dumps it in a stack. If it is possible to get onto the fields, a trap door, next to the silo, is opened which allows the manure to drop directly into the spreader.

"Last year I stacked my manure from the 25th of November until pasture time, with the exception of one month in the spring. The season was very difficult. However it did not take long to handle the accumulated pile in the summer with the aid of my tractor scoop.

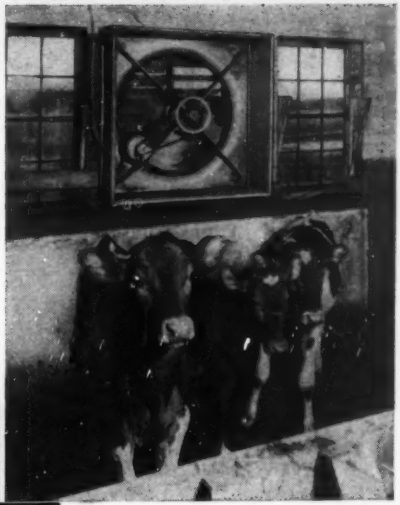
"The cleaner is powered with a 2 HP motor and it requires just 17 minutes for the last of the manure to go over the end of the elevator. My barn is 90′ long, yet the total cost of my cleaner, not counting my own labor, was slightly over $1200.

"The cleaner has been in operation now for two full years and has never missed a day. I just wanted you to know how much I appreciate electricity and what can be done with it."

Ventilation Boosts Herd Health

Fans Provide 50° Temperature; Fresh and Pure Air, Freedom From Dampness and Drafts

By GORDON WARFIELD

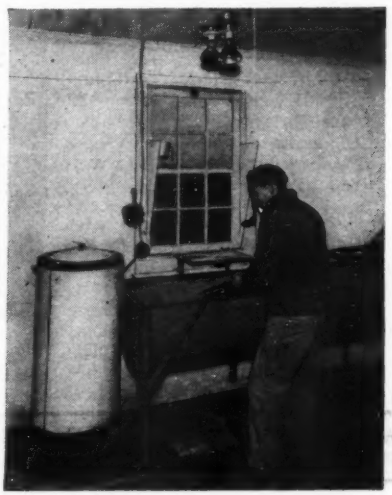


Above: Here is one of the two fans that carry off excess heat and humidity. Shutters in front of the fan blades close automatically when the fan stops, to prevent backdrafts of cold air from blowing into the barn. **Left:** Mr. Wessel is shown here adjusting one of the two thermostats which control the fans' operation.

Nothing contributes more to the good health and comfort of a dairy herd than adequate ventilation in the barn—a fact that was clearly demonstrated last winter on Mr. Melvin H. Wessel's Plain View Farm near Lisbon, Md. After installing a modern electric ventilating system in November, Mr. Wessel noted such important benefits that he now considers it an indispensable aid to dairying activities. He said:

"In 1950, pneumonia killed three of my cows. Last year the health of the entire herd was better than it had ever been in cold weather—an improvement which I attribute directly to the better ventilation. The temperature remained around 50 degrees all the time, and the air was fresh and pure, with no dampness or drafts. Formerly this problem of ventilation had been impossible to solve. The air was so foul and damp that I could hardly get my breath when I walked inside, and opening doors, windows or the hay hole only added a chill without getting rid of the dampness. The herd fared poorly under these conditions, my hired man and I were forever catching cold, and the barn was beginning to rot badly in some places.

"I had tried so often to improve the situation myself that I didn't really believe an electric ventilating system would help matters much, and was therefore hesitant about having one installed. When I finally had one put in on approval, I was completely amazed by the results. Two weeks' trial sold me on its value."



This electric water heater simplifies clean-up chores in the dairy house. Note the infrared heat lamps on the ceiling to provide wintertime comfort.

The ventilating equipment consists of two electric fans, one ⅙ HP and one ¼ HP unit, mounted to discharge air through openings in one side of the building. Thermostats turn the fans on and off automatically to carry away excess moisture and maintain uniform temperature conditions.

Mr. Wessel also had an electric barn cleaner installed last November, and when illness later forced him to turn all the work on his place over to Paul Manning, his farm helper, it really proved its value as a labor and time saver. For a whole month, Paul had to handle all the work without assistance.

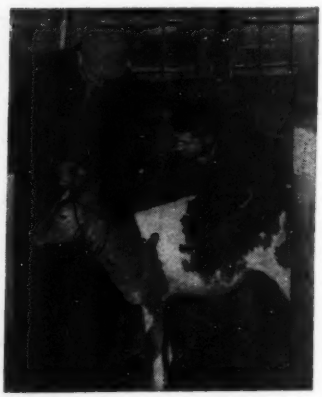
"That barn cleaner saved the day. Without it I could never have kept up with the job. It only takes about 15 minutes for one person to clean the barn thoroughly, where formerly it took almost half an hour with both Mr. Wessel and myself working as hard as we could."

Other electric equipment for

The barn cleaner, driven by a three hp motor, dumps the manure directly into the spreader. Just fifteen minutes are required to thoroughly clean the barn. The labor consists of pressing the starter button.

saving time and increasing profits includes cow clippers, milk cooler, dairy water heater, milkers and infrared heat lamps to maintain comfortable conditions in the dairy during cold weather. An electric dehorner has also proved a valuable working tool.

Born and raised near Fulton,



Dehorning of young stock is done quickly and easily with this modern electric dehorner. The equipment leaves no open flesh wound, and there are no bad after effects.

Mr. Wessel has been milking cows since he was a lad of eight, and was the first boy in his county to receive the Maryland State Farmers Degree awarded through the FFA of Clarksville High School. He now owns 250 acres of some of the finest land in Howard County and a herd of 75 registered Guernseys. The herd is fed about 150 tons of alfalfa hay each year, together with grass silage and a half and half mixture of home grown corn and 24 percent dairy feed.

Modern soil conservation practices are applied on this farm to ensure more efficient utilization of the land and to preserve and enhance the value for the future. In 1950 and 1951 Mr. Wessel received first prize in the Maryland Greener Pastures Contest of Howard County, sponsored by the USDA Production and Marketing Administration.

Ultraviolet Light For Celery

Invisible light is a new tool for the study of brown checking of celery at the University of California's College of Agriculture.

Arthur R. Spurr, department of vegetable crops on the Davis campus, found that diseased areas on celery stalks show up brightly under ultraviolet light, often before the disease is visible under natural light.

Brown checking, a nutritional disease caused in part by boron deficiency in the plant, is a problem in most celery growing areas in California. Under natural light, brown checking shows up as brown cracked areas on the insides of the celery stalks. But under ultraviolet light the tissue surrounding the diseased areas appears bright blue, especially in the early stages.

On badly diseased plants the outsides of the stalks also show brown cracks. In the advanced stages the diseased tissues on both the inside and outside of the stalks often show bright yellow spots under ultraviolet light.

Just why celery tissues suffering from brown checking show up brightly under ultraviolet light is not yet known. For the researcher these fluorescent phenomena are proving to be one more useful tool in the study of this as yet little-understood disease.

Auger Unloads Crib

Freedom from soft corn worries and higher market prices are but two of the many benefits that the Roy Tabors of Prophetstown, Illinois, receive from their shelled corn batch drier. Using fan-forced, heated air, the drier reduced the moisture content of 600-bushel batches from 24% to 14% in about eight hours. The steel drying bin has a false floor under which the heated air is

blown. After each batch of corn is dried, it is removed effortlessly by an auger shown above. In actual practice the shelled corn drops into a portable elevator which transfers it to wagons or to storage cribs.

Missionary strawberry plants received light periods of 8, 11, 14, 17, and 20 hours, or corresponding dark periods of 16, 13, 10, 7 and 4 hours, from left to right. Two plants on left flowered but produced few runners; three plants on right produced abundant runners but did not flower.

Photoperiodism - The Dark Secret

How Nights and Lights Affect Plant Growth

By H. A. BORTHWICK

Certain plants are exceedingly sensitive to very small amounts of light. House-grown poinsettias, for example, often fail to flower by Christmas because of the artificial light they receive each evening, and in the greenhouse they have been known to fail because of light received from nearby street lamps. They require long dark periods for flowering. Greenhouse-grown barley, on the contrary, is unable to flower during winter unless it receives some additional light each night. It requires short dark periods.

Many plants respond just as poinsettia or barley do when subjected to dark periods of different length. Thus hemp, soybean, chrysanthemum, millet, and many of our fall-flowering weeds require long daily dark periods for flowering. Wheat, oats, barley, rye, beet, spinach, tuberous begonias, and certain summer-flowering weeds can only flower when the daily dark periods are short.

This control of the flowering of many plants by duration of darkness was discovered by W. W. Garner and H. A. Allard, of the United States Department of Agriculture. That was about 1918 while they were studying the conditions required for flowering of Maryland Mammoth tobacco and Biloxi soybean. At the time the discovery was made it seemed probable that the duration of the daily light period was the controlling factor. So the phenomenon was called "photoperiodism." For this reason the soybean was called a "short-day" plant.

Several years later it was found that daily duration of darkness, not light, was the condition that controlled flowering. It is the long nights of late summer and fall that induce chrysanthemums to flower, not the short days. Chrysanthemums were originally called "short-day" plants and this term still persists, but now they are also often called "long-night" plants. In a similar way the terms "long day" and "short night" are used to describe the flowering response of such plants as barley and spinach.

All Plants Are Not Noticeably Affected

Although nightlength controls the flowering of many of our crop plants, it is seemingly ineffective in others. Tomato is a good example. Such plants are called day-neutral, or indeterminate. They probably contain the same light mechanism as plants that are responsive to nightlength, but for some reason are not noticeably influenced by it.

As soon as photoperiodism was discovered growers began using artificial light to regulate flowering of certain kinds of plants. At first they were very careful to use the light either morning or evening so as to extend the duration of natural light without interruption. Later, when it was found that the daily duration of uninterrupted darkness was the controlling condition, it proved to be more efficient to use the light near the middle of the night. When long dark periods were thus divided by light into two successive short ones, the flowering response was reversed.

For poinsettia, soybean, and hemp, interruptions as brief as one minute at midnight may effectively prevent flowering. For other long-night plants, somewhat longer interruptions may be required. Interruptions of only one minute stimulate flowering of some varieties of barley, and an hour of light in the middle of the night effectively promotes flowering of most barley varieties.

It is economically feasible to use supplemental light to control flowering of many kinds of plants. For years the growers of chrysanthemums under glass have known that they could delay blooming by extending the daily period of natural light with several hours of artificial light. Now they use artificial light for about an hour in the middle of the night and get the same delay. Early varieties can be used throughout fall and winter.

Artificial light prevents

Sugar beet. Plant on left received eight hours natural light and sixteen hours dark per day. Other three plants received eight hours natural light followed by eight hours artificial light at intensities of about 20-foot candles. Artificial light for plant on right was from an incandescent-filament lamp; for two plants in center, from fluorescent lamps.

flowering of sugar cane in tropical regions. Flowering is objectionable because it stops growth of the stalks and thus reduces sugar production. Cane flowers only when the dark periods reach an intermediate daily duration. During midsummer they are too short to promote flowering and in winter they are too long, but in autumn they are just right. If a small amount of artificial light is used near the middle of each night for two or three weeks at this time of year, flowering does not occur.

How can light be used to benefit the growers of field crops such as cereals, corn, soybeans, and others that are grown on such large acreages that lighting the fields would seem to be economically impossible? The answer is that light has long been used on some of our most widely grown field crops. This use has not attracted wide attention but it has, nevertheless, been of very great importance to farmers in every part of the country. It is used in developing new strains. In breeding a new wheat variety, for example, many generations must be produced before the variety is ready for release. Three generations a year can be had by growing two in the greenhouse. Only if artificial light is used, however, will the plants grown out of season flower. They require only an hour or two of light in the middle of the night and the intensity need not exceed 10- or 20-foot candles. But the plants will remain flowerless until spring unless they get this light.

In some instances light is required even in summer. Peppermint, for example, does not flower well in the latitude of Washington, D. C. But when given light in the middle of the night it flowers earlier and more abundantly. This is equally true for related mints with which peppermint is hybridized. Artificial light brings them all into bloom simultaneously, thus making hybridization possible.

Nights Govern Blooming Date

These direct applications of artificial light to crop production are not the only benefits the farmer derives from knowledge of photoperiodism. It helps to explain many of his standard practices and suggests others. Weekly plantings of soybeans throughout the spring, for example, do not necessarily bloom or mature at weekly intervals. With some varieties such successive plantings may all bloom at the same time. Flower bud formation in such cases occurs on the date when the dark periods reach the proper daily duration. Choice of planting date would thus be made on the basis of considerations such as ease of weed control and size of plant desired at maturity rather than date of blooming.

In other words this tendency of successive plantings to bloom simultaneously, though not so marked, is still evident. Thus, for some kinds, a 30-day difference in planting might result in about a 10-day difference in flowering or maturity. For unusually late field plantings, made necessary by weather conditions or sequence of crops, it is sometimes recommended that the farmer use an earlier variety of soybean than would be selected for normal planting dates in the region. This has its basis in the different relative rates of development of the re-

Field plot of mint receiving artificial light at night to hasten blooming. Plants of two varieties alternated in each row. Light induces simultaneous blooming of both varieties and makes natural hybridization possible.

spective varieties under nightlengths then prevailing.

The adaptation of varieties to particular areas is often dependent largely on their dark-period requirements. Thus, there are varieties of strawberry that do well in Florida but not so well farther north. Other varieties, not well adapted to Florida, produce very well in the Carolinas. And still others prove superior to these at more northern locations. Differences in temperature tolerance are partly responsible for this distribution of strawberry varieties but the respective nightlength requirements of the different kinds play an equally or possibly more effective role.

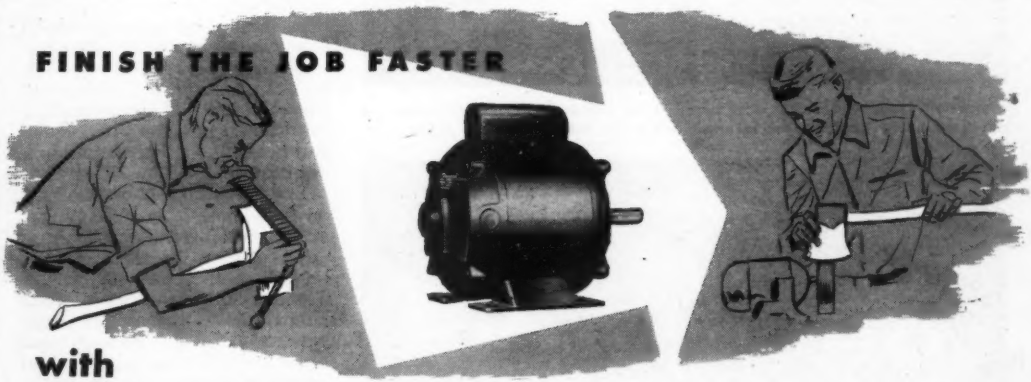
Bulb formation in onions is regulated in part by nightlength, long nights delaying and short nights hastening the process. Here, also, the effect of a particular daily duration of darkness differs with varieties. Those adapted to southern states but planted in the north often form tiny bulbs as soon as the seedlings have two or three leaves. However, a variety adapted to the north would not begin to bulb until later in the spring when the daily duration of darkness had decreased considerably. If a northern-adapted variety is planted in the extreme south, it may never form bulbs because the nights never become sufficiently short.

Night Length Same Each Year

Although nightlength changes from day to day, and at a different rate in different latitudes, it always varies in exactly the same way from year to year in a given place. This is not true for variables such as soil fertility, temperature, and moisture conditions, which vary in a random way. Nightlength is thus one of the most accurately predictable environmental variables that influence plant growth and development. This is an important reason for our ability to assign a variety to a particular locality with considerable assurance that it will prove successful.

For control of flowering with artificial light the ordinary incandescent-filament lamp is entirely satisfactory. The light from such lamps is largely red and it happens that red light is far more effective than any other color for this particular light reaction in plants. Fluorescent lamps are less satisfactory, particularly for some kinds of plants. Beets, for example, produce flower stalks very promptly when given incandescent-filament light but remain vegetative when given an equal intensity of fluorescent light. This is clearly shown by picture on page 12.

This lack of effectiveness of fluorescent light for promotion of flowering of beet does not mean that it may not prove satisfactory for control of flowering of other kinds of plants. There are, moreover, other kinds of light reactions in plants that have quite different light requirements. For certain of these, fluorescent light has proved entirely satisfactory. Each kind of reaction has its own requirements of intensity, color, and in some cases duration of light. These requirements are effectively and inexpensively met by the ordinary incandescent-filament lamp.



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Mercury Tends the Brooder

Motor Driven Switches Turn Lamps On and Off

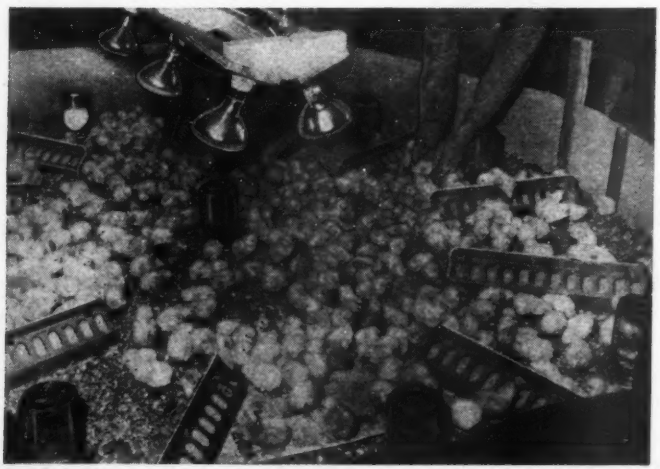
By HOWARD CLAPPER

For the past several years countless poultrymen have been switching to infrared heat lamps for brooding.

Ask why and they'll tell you that they're switching because they like the results. Freedom from damp litter common with hover type brooders, low first cost, rapid feathering, and the fact that chicks can pick a temperature that suits their varying needs are all factors that have added momentum to the switch to heat lamp brooding.

The one disadvantage has been the lack of efficient and inexpensive controls for turning lamps on and off as the heat requirements of the chicks varies.

The overall layout—three 500 chick broods were started on each floor. After ten days, cardboard barriers were removed and chicks ranged over the entire area.



Water, feed, and warmth—that's what the chicks need, and get with this arrangement. The chicks are visible at all times, too. Notice how evenly they have arranged themselves.

The average poultrymen has had to:

1. Let his lamps burn all the time or turn them off and on manually;

2. Settle for four- or six-lamp batteries with half the lamps controlled by small wafer type thermostats and with the other lamps burning all the time. And either way he may have used more electricity than was actually needed to do the job.

Walter Hines of Wayne Twp., Ohio, used a different method. He has a new 4,000 chick broiler house equipped for heat lamp brooding and he has a new way of controlling the lamps so that the heat output closely matches the chicks' requirements for heat.

Walter's controls were developed from standard equipment adapted to the job of heat lamp brooding. His equipment includes:

1. A rheostat or wiper action thermostat,

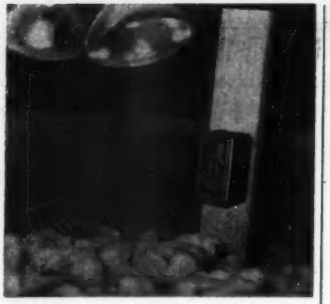
2. A low voltage motor with four Mercury switches mounted on the motor shaft,

3. A transformer relay to power the 26 volt motor, and

4. Four contactors that make and break the circuits supplying the heat lamps.

Since Walter's house is built on two floors it was necessary, on account of the temperature differential, to install a separate set of controls on each floor. Three 6-lamp batteries of heat lamps are used on each floor with each of the 6-lamp units brooding 500 chicks. In actual operation this is the way that the control equipment works. There is one thermostat, on each floor, placed about 6" above the litter just outside the circle of heat provided by the lamps. Then, as the heat requirements of the chicks increase with a drop in air temperature at the thermostat location, things happen.

One of the six lamps on each unit burns all the time. The first call for heat closes the circuit to the low voltage motor. It then



The one thermostat on each floor is located at extreme edge of heated area, about six inches off the floor. Wire guards were later placed around thermostat.

rotates just enough to tilt a mercury tube and the contactor on that circuit closes bringing on the No. 2 and No. 3 lamps in each battery on the floor. The second call for heat brings on all the No. 4 and No. 5 lamps and final call brings on the No. 6 lamps. As the heat requirements lessen the lamps go off in reverse sequence.

The control equipment cost $225.00 for each floor and the heat lamps for the brooding units cost only $1.10 each, or $6.60 for each 500 chicks. So his investment was pretty well in line with what it would have been with good conventional type hover brooders. What's more, he has all the advantages of heat lamp brooding plus controls that match the heat output to the chicks' requirements.

Last Spring, 3,000 day-old chicks were started. Test meters were installed on each floor of the Hines' brooder house. For the entire brooding period 984 KWH were used on the upper floor and 1554 KWH were required for the lower floor. Apparently a few BTU's from the sun leaked in through the ceiling. This, plus a few more that leaked up from the lamps on the ground floor cut the heat bill for the 1500 chicks on the top floor. Added together it makes a total power use of 2538 KWH for 3,000 chicks or about 5/6th of a KWH per bird. At five weeks the average weight of the birds was 1¾ pounds and the mortality was a little under 1%. No wonder he's pleased with his brooding methods!

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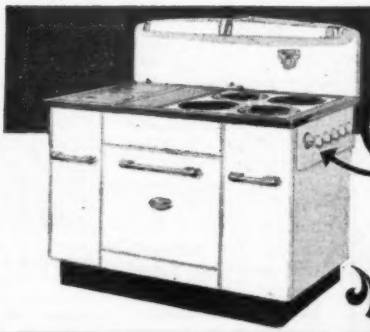

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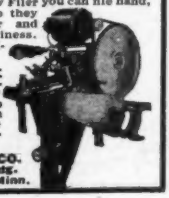

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Magic Home in Magic Valley

Good Wiring and Judicious Usage Provide Electrical Convenience at Low Cost

By OTTO R. KUNZE

Applications of electricity on the farm today are limited only by the farmer's ability to conceive ideas by which electricity can make his home more comfortable and secure, and his farm chores more interesting and enjoyable. A man who has applied his initiative to achieve these ends is Emil Richard, a small citrus farmer near McAllen in the Rio Grande Valley of Texas.

Emil, who generally wears a feather in his hat, is well past his middle age. However, at his work, he still seems to be in the prime of life. In reality the interest, ideas, and energy which Emil has will never let him grow old.

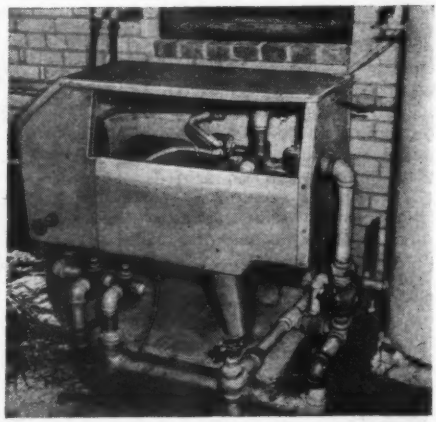
The Richard home is a small, simple, five room dwelling constructed of lumber which Emil and his wife brought with them when they migrated from Mississippi to the magic valley of Texas more than 18 years ago. To the nondiscerning visitor, the home would seem to be an ordinary one. However, a closer inspection soon reveals that it is anything but ordinary.

The first indication which shows that the home is inhabited by someone who is electrically minded is the lightning arrester cable which runs around the eaves of the flat-roofed dwelling. This cable is grounded at two opposing corners of the home. All the major appliances in the house are also grounded.

Before entering the front door, a person can readily see a small metal box hung under the eaves. Its contents will probably never annoy an invited guest, but instead its purpose is to announce the arrival of an unexpected intruder. Just to illustrate, Emil opened a closet door and nothing happened. However, when I attempted to open that same door, the burglar alarm sounded. When questioned about the completeness of the alarm system, Emil chuckled and said, "I just dare any stranger to come within 20 feet of my home without my knowing about it."

After entering the home, a person sees the usual electrical appliances. The electric refrigerator is of special interest since Mrs. Richard proudly states, "We have had it for 13 years and it is still as good as new." The range which is rather new, is the second being used in the Richard home. The first one was used for 12 years. After that time, it was very much like a woman's dress, not worn out but just out of style. As a result the new range was purchased.

The home is heated by five 1000 watt radiant glass heaters. Each of these is operated by an individual switch, but while in



Protective housing for the fire and domestic water pumps. The inter-connections of the pipes enable the Richards to get water under pressure wherever they want it. Also notice the neat wiring installation leading to the pressure switch.

operation all five are automatically controlled by a single thermostat. Since the home is very thoroughly insulated, two heaters are usually sufficient to keep the house warm.

The Richard home is not only warm in the winter but is also cool in the summer. The heart of this cooling system is a two speed, nine blade, eighteen inch electric attic fan. Instead of drawing the hot summer air in through the windows, Emil conceived a better idea. He installed an air grille in each room and then ran ducts down the wall and under the house where the air is cooler. Although the system is not complete, it is quite satisfactory, according to Emil.

What Emil wants, however, is more of an air conditioning effect and he plans to get it too. He is presently thinking of making the house foundation air tight with the exception of two openings in which he hopes to install some filters. Then by keeping these wet, he intends to have an evaporative cooling system and filtered air as well. If this proves unsatisfactory, he has another idea which is to draw the incoming air through several hundred feet of large underground irrigation tile before pulling it through the filters and into his home.

Fan Serves Several Rooms

Within the home, special provisions have been made to keep from drawing the kitchen and bathroom odors through the adjoining rooms to the fan. This was done by mounting the fan in the ceiling and then boxing in a small portion below. Ducts were run from the bathroom and kitchen range into this enclosure. A free swinging stainless steel door hinged at the top in one end of the enclosure restricts the flow of air from the adjoining rooms sufficiently so that good ventilation is obtained in both the kitchen and the bathroom.

Hot water for the kitchen sink is no problem in the Richard home. A thermostatically controlled calrod heating unit located under the sink serves this purpose. A small well insulated storage tank keeps some hot

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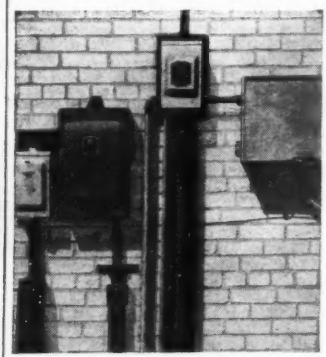
WRITE FOR CATALOGUE

SMITH-GATES CORP. PLAINVILLE, CONN.

water in reserve. This arrangement has worked so satisfactorily that a similar installation is being planned for the bathroom. The Richards prefer this system since practically no heat is lost and very little water is wasted.

Fire protection is another item which has not been overlooked. With no city water supply available, the Richards turned to rain and irrigation water to meet their fire fighting needs. Four storage tanks were constructed immediately behind the house. One of these is an underground reservoir which can be filled with irrigation water. The other three are above ground and are generally filled with rain water which is also used for domestic purposes.



Switching and multi-breaker installations are located on the garage wall between the service pole and the Richard home. The box on the right contains a disconnect switch and motor protection for the fire pumps. The bare wires with the connectors are ground wires.

To meet the threat of a fire, the Richards have two pressure pumps on an individual circuit. One of these is used for domestic purposes, but can be used to fight fire if necessary. The other was purchased and installed solely for the purpose of fighting fire. Its capacity is 1500 gallons per hour or 25 gallons a minute.

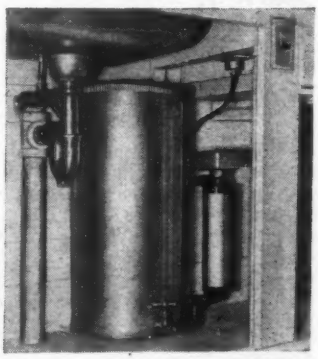
A 50 foot section of fire fighting hose has been installed on a reel to insure swift action. Since the fire pump automatically keeps a pressure of 30 pounds in its pressure tank, all that is necessary in an emergency is to turn on a valve and run with the hose. Pipes with faucets have also been laid to either side of the home so that additional hoses can be connected.

The monthly electric consumption for the Richards is more reasonable than most people would expect. Within the past two years the highest number of KWH consumed in one month is 396 while the lowest is 114. One reason the electrical consumption is so low is the more than adequate wiring system which has been installed. The entire house is wired with No. 10 wire. And special circuits are used for all heating appliances. The feeder circuit to the radiant heaters starts with No. 4 wire and finally ends with No. 8 wire.

The wiring installations are very neat and show good workmanship. All exterior wires running from the meter to the multi-breakers and into the house have been placed underground in rubber suction hose. Emil believes this practice to be better than using ordinary galvanized pipe.

While making the wiring installations, Emil was thinking of possible future loads. As a result he installed two multi-breakers each of which has a 50, a 35, and two 20 ampere break-

. . . . . (More on page 29)



An automatic electric water heater is located under the kitchen sink. The small container on the right is the heater with a thermostatic control. A small storage tank is located inside the large container which is heavily insulated. The switch, which is conveniently located, can be used to completely disconnect the heater.

To start 1953, a SODDEN THOUGHT: TOO many people treat New Years as an ALCOHOLIDAY....OVERHEARD: "Everybody is on vacation so our office is terribly UNDERHANDED." .... Just the other day we saw a SWORD SWALLOWER gulp down a handfull of PINS and NEEDLES. When we asked him HOWCUM he replied, "I'M on a DIET!" .... In his new book GOOD FOR A LAUGH, our friend Bennett Cerf credits Jim Marshall with this list of ALLEGEDLY living and solvent citizens. Here they are, complete with addresses: Hans R. Dirty, Jr., Goan, Wash.....Quoth D. Raven, Never, Mo..... G. Thirza Mighty, Pritty, Miss. .... Ide Lamy, Down, N. D. ....Lettice Finder, Shady, Del..... F. U. Pager, Income, Tex. ..... I. M. Phelan, Slightly, Ill.....Daniel Inner, Lyons, Tenn.....Will U. Raider, Cookie, Ga..... PROOFREADER: a TYPE RIGHTER.... SAILOR: a fellow who, when he talks SHOP, talks SHIP .... OLD TIMER: a fellow who can remember when the government was criticized for giving away SEEDS .... It won't be long before we'll be receiving SEED CATALOGS which will show BEAUTIFUL pictures of everything EXCEPT the backache. Our lil wifie sez if her garden isn't any better THIS year than LAST year she's ready to throw in the TROWEL .... Gil Rogers in LAUGH BOOK gets off this little JINGLEJOLLY: "A RICH widow lady named Carrie, JUST wasn't TOO anxious to marry; But a salesman named Pete Rushed the gal off her feet, SOME bargain he got—CASH and Carrie!" (Caw! Caw!)....Most modern gals as they go HUSBAND HUNTING are hoping to find a man that's rich. They want to be sure he is TALL, DARK and HAS SOME .... HELICOPTER: the shortest distance between two points .... "Dearie," cooed his wife, "WHAT was the FIRST thing about me that attracted YOU to me?" "Simple," replied her hubby, "YOU had your mouth SHUT." .... We know a gal who is married to a guy in the COFFEE business. She worships the very GROUNDS he works on .... PARTING THOUGHT—a FRIEND is a person who goes around saying NICE things BEHIND your back ....

Your pun-peddler—DUFFY.

What Would You Say?

Rhyme Contest

Here is a contest the whole family can enjoy. Cash Prizes will be awarded for the best suggestion for a fourth line to complete the verse at the bottom of this page. Lots of fun and you may win $25 cash.

RULES—JANUARY CONTEST

Seven cash prizes will be awarded for the best last line to complete the verse in the coupon below. Your suggestion should rhyme with the second line.

The first prize will be $25 cash; the second prize $10. In addition, five consolation prizes of $3 each will be awarded for the best last line furnished.

In case of a tie, each winning contestant will receive the full cash prize to which he or she is entitled.

All members of the farm family to whom this magazine was sent may enter but each contestant may submit only one line.

Question "A" must be answered.

Entries must be sent to the Contest Editor, ELECTRICITY ON THE FARM Magazine, 8 So. Dearborn Street, Chicago 3, Ill. before Feb. 10, 1953.

The decision of the judges is final and all entries become the property of ELECTRICITY ON THE FARM Magazine.

Winning names and entries will be announced in the April 1953 issue.

Send your entry on the coupon or make out a similar form on a plain sheet of paper or government postcard.

When roads are slippery and weather is mean
We don't need to worry a bit
To supply our cuisine on our freezer we lean

? ? ? ? ? ?

My suggestion for a fourth line to the above verse is:

.....

A. What Electrical problem or question would you like to have answered in this magazine?

.....

.....

.....

My name is.....

R.F.D......**Post Office**.....

County.....**State**.....

Better Pans Mean Better Cooking

What to Look For When You Buy Utensils

In October, an article explored the ways proper oven utensils can prevent baking failures. Now Elizabeth Beveridge describes what homemakers need in top-of-range cooking utensils, and tells what to look for when you buy utensils.

By ELIZABETH BEVERIDGE

A good electric range needs the help of good utensils if it is to do its job economically and well. Almost any kitchen has some good pans and some poor ones. The better ones should get the more important jobs to do, and as new utensils are purchased they should be selected with care to give the best service.

The pans that are in daily use deserve first consideration. In most homes these are the coffee maker, saucepans of three sizes from one to four quarts, and two fry pans. These were the utensils that were used most by three groups of farm homemakers in Rhode Island, Nebraska, and California when they systematically took stock of their kitchen wares.

The saucepans (or perhaps one is a saucepot with two close-to-the-side handles instead of one long one) are used for the daily vegetables, for cooking cereals, and stewing fruit. It takes different sizes because a mess of peas or lima beans would be lost in a pan big enough for spinach or a big batch of potatoes. But the size should be right for the range as well as the food. A pan that covers the heating unit is in a position to absorb most of the heat produced. Any pan for vegetable cooking should be as large in diameter as the small unit of the range so you can make use of full heat for bringing the food quickly to a boil. The big saucepan may be right in size for the large range unit but it will often be used on a small one because a big fry pan has undisputed first claim to the big unit.

Some electric units have a center section that can be heated independently of the outer ring. If yours are of this type you may find a small diameter coffee maker practical. But if speed in getting the coffee made is important, a maker with a base that will practically cover the whole unit will serve you better. With units of the single tube type that are uniformly hot over the entire surface at every switch position, your pans should all be as large in diameter as the unit. Even very small pans suitable for making a pudding sauce or reheating a small amount of food come in different diameters and with broad bases.

In fry pans the kinds and amounts of food you cook are the determining factors as far as size is concerned. All large fry pans are wider than even the large unit. This makes it important for a fry pan to be of a material that will carry heat uniformly to the outer rim so the food there will cook as well as that in the center.

Aluminum is a good heat carrier, so pans of this material heat evenly and well. Copper—an even better conductor of heat—is sometimes teamed up with stainless steel to give the heat-conducting properties which steel lacks. Steel contributes to the combination a cooking surface that is unaffected by food and is very durable. (Copper—if used in contact with food—must be kept scoured bright to be safe, so using it on the outside of the pan eliminates the necessity of constant scouring.) Aluminum too is used on the surface of steel to increase the evenness of

Pans and kettles suitable for use on the electric range. The small enamelled one should be used only on a unit with a separate center section.

heating. Cast iron does not heat so readily nor so evenly, but it does hold heat well and is still a favorite with many women in spite of its weight.

In saucepan cooking there is usually water or other liquid which helps to distribute heat so a good conducting material is not so important. And because of the moist food contained, saucepans do not get as hot as fry pans and are not usually subjected to such sharp changes of temperature. Metals used in saucepans are often lighter in weight than those used in fry pans. Glass and enamel are popular in saucepans too.

Most Pans Need Covers

Well-fitting covers are important on all pans used for moist cooking. In surface cooking, pans used only for frying are about the only ones that do not need covers, though a small open saucepan may also come in handy. With a good tight cover you can use a small amount of water, and that results in fast heating up and economy in the use of electricity. It means better food too because the small amount of nutrient-laden liquid that is left can be served with the food instead of being discarded. A high-domed cover for a fry pan gives the depth needed for such things as pot roasts and chicken.

Bottoms of pans for use on an electric range should be flat for good contact with the unit. Flat-bottomed pans are safer too because they don't teeter either on the range or on a table, and aren't easily tipped over.

Aluminum pans, through long use (and occasional or more frequent boiling dry) may have become warped or bulged on the bottom. These can often be flattened. To do it, find a flat block of wood as near the inside diameter of the pan as possible. Invert the pan over the block and gently pound the pan bottom with a wooden mallet. Or lay a board on the pan bottom and pound it with mallet or hammer.

Handles are for convenience in holding pans, but they sometimes prove to be inconvenient. Handles for large fry pans and saucepans should be large enough and long enough to afford a comfortable but firm grip so hot, heavy pans can be handled safely. The same sort of handle on a small saucepan can be a nuisance by overbalancing the pan and causing it to tip. But since the small pan is light even when filled, it isn't so necessary to grasp it firmly and a small handle is very suitable.

Large saucepots have pairs of handles for two-handed lifting. Some women prefer such handles on smaller pans too. They do take up less space on the range and in storage, but such pans are harder to pour from.

Twin fryer, Dutch oven, covered fry pan, griddle, and small fry pan—all with good, flat, heat-absorbing bottoms.

Use Care With Large Vessels

Big kettles and canners are much wider than the range units. If one of these fits down too close to the enamelled range top, it will trap heat and cause discoloration and crazing of the enamel. Before using such a kettle on a new range set it on the unit. You should be able to slip an ordinary lead pencil between kettle and range top. If you can't, you had better get some sheet asbestos at the hardware store and cut some pieces an inch or so square. Stack the pieces to make little blocks that will support the kettle. Use four or five of the blocks evenly spaced so there is plenty of room for air to circulate between them. Make the blocks no higher than necessary because if you raise the utensil off the unit it will be slower in heating.

In oven pans, size and material are the most important considerations. Here too size must be right for both food and range. Some folks buy big oven pans on the theory that you get more for your money in the larger sizes. You do—as far as the amount of material in the pan is concerned—but what was saved in pan purchase price may be lost quickly in poorly baked food if the pans are too large.

Just what oven utensils you want is quite a personal matter. It depends on your own cooking habits. The new homemaker will find a pair of layer cake pans, a cooky sheet, a square cake pan, two pie pans, a loaf pan, a large pan for roasting, and a casserole a good starting set. Others such as muffin and tube cake pans can be added as you feel the need for them.

Plain Utensils Best

In buying any utensils watch for smooth surfaces and few creases or seams. There is always spattering fat around a range and it never fails to find nooks where it can lodge. Choose pans of good quality so they will hold their shape well.

Women often ask whether it

is better to buy individual pans or a set. If you like one material for all your pans and can find a set with just the pieces that you need, you might as well enjoy the handsome appearance of a matched set. However, many women like different materials and like to choose each pan for a particular purpose. If you do consider a set, just be sure that all the pieces included will be useful to you. Even one piece that you rarely use increases the actual cost of the pieces you do use. A few serviceable pans are worth more than many half-useful ones—and what's more they take up less storage space and don't get in the way of each other.

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Vacuum Cleaners are Versatile

Let Them Handle the Odd Jobs Around Your Farm

By **MRS. E. KELLER**
Cayley, Alberta, Canada

For years, vacuum cleaners have been valued and efficient—but commonplace—appliances in the homes of city women, used almost exclusively for cleaning carpets, draperies, and upholstered furniture. But not so in the country!

Weevils, wasps, and flies succumb to the cleaner. Mrs. Thomas Finch, of Rustburg, Virginia, finds the vacuum a real helper in ridding her home of pests.

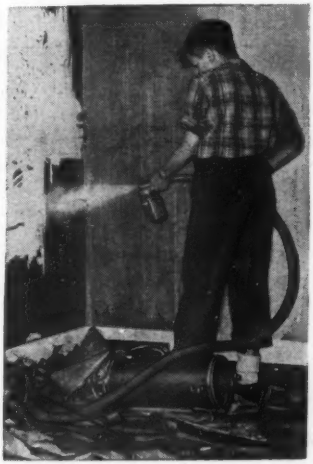
We got into a discussion of vacuum cleaners at our last Farm Women's meeting. Anne was telling Marguerite how she used her vacuum to clean the crumbs from the bread drawer, and Marguerite told Anne it was handy, too, to clean out ash trays, and to pick up scattered down after wild ducks are picked. Mrs. Olson joined in and told how good hers was to take up the dust and chaff that fell from Frank's clothes when he came in from combining, and to clean the cuffs of his pants before they went into the washer.

"That reminds me," said Mabel Duncan, "I caught Bill walking out the back door carrying my new cleaner. I yelled, 'Bill, where are you going with that?' 'Oh, I won't hurt it,' he said. 'I'm just going to blow the grasshoppers and chaff out of the tractor radiator. The thing is running hot.'"

"We saved a calf born during that 40-below-zero weather last winter," said Laura. "John carried it into the house, wet and chilled, almost a-goner. We held the tank of the cleaner over the stove so that it would draw in hot air, then with the hose attached to the blower end, we dried off the little fellow in almost no time."

"I don't know what the scientific explanation of this is," said Mrs. James, "but it does work. Sometimes the hot air from our old-fashioned furnace just won't rise to the upstairs registers. I found that if I place the vacuum cleaner tank close to the register the suction starts the heated air to circulate."

Then Mary told one that couldn't be beat. Her daughter, Nancy, was using the vacuum cleaner in the kitchen one day when a little mouse scampered across the floor and ran behind the refrigerator. "Get him, Nancy!" yelled Mary as she took up position at one end of the re-



Removing wallpaper? Just give it a spray treatment. Results are wonderful.

Mrs. Wanda Mosser, of Mill Hall, Pennsylvania, uses her vacuum to clean the hot air pipes and registers. Besides doing a good, quick, job, it has also recovered some small valuables. It picks up all the dirt and the small odds and ends that the children are constantly losing down the registers. Incidentally, when the pipes are cleaned regularly, there is less dirt for the heating system to spread through the house.

frigerator. Nancy, at the other end, gave the poor little mouse a whack with the end of the vacuum rod, when, lo and behold! he just vanished.

They took the cleaner outside to open it up, and out from the dirt bag rolled a little ball of fluff and dust that immediately scampered across the yard.

No one had a better story, so the president rose and said, "Will the meeting please come to order."

How to Reduce Fuel Costs

Insulate, Ventilate, and Dehumidify

Winter weather makes us aware of insulation problems we never think of other times of the year. Regardless of where you live, north, south, east, or west, insulation is one of the best means of controlling heat in houses. It not only keeps heat in during the winter, but it keeps heat out during the summer. Insulation also makes it easier to have good ventilation. However, you must select and install insulation correctly to obtain the long-time fuel savings and comfort expected from the investment.

Dehumidifiers can remove several gallons of water from the air in a 24 hour period. They work on the principle of a refrigerator and condense moisture from the air that is drawn through them by a small fan. Such a unit will keep a basement, or similar area, free from dampness, or corrosion, the year round. They can be plugged into a regular convenience outlet.

Insulation does not stop heat from moving from hot to cool walls, but rather slows it down. This effective slowing down is done by trapping air in the porous cavities of blanket, bat, or fill insulation. Most insulations for home use have close to the same insulation value, if they are of the same thickness—whether made of mineral, animal, or vegetable materials. They also are made resistant to fire, insects, and rodents.

What thickness of insulation should be used? Studies show that the first inch saves the most fuel, the second does not save as much as the first, nor the third as much as the second. Usually two inches will provide most economical savings of fuel.

It is important to reduce the amount of moisture in the house once it is tightened up with insulation, storm windows and doors. This is best done through the use of electric ventilating fans, particularly in the kitchen and laundry area (see May, 1952, Electricity on the Farm). Sometimes the bath-

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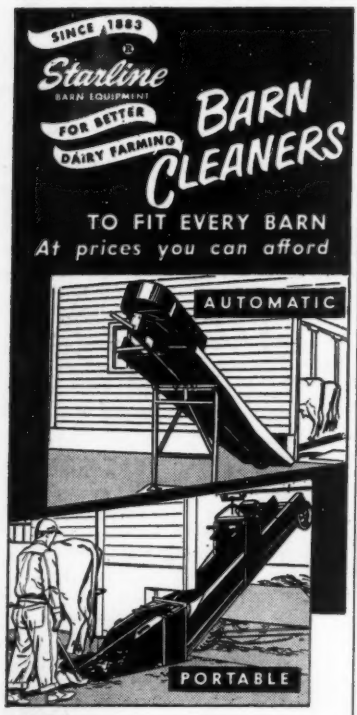
SAVE TIME AND LABOR

room, especially one with a shower, needs a fan. Regulating the furnace humidifier is another way to reduce moisture.

Then, too, there are the portable dehumidifiers which can be moved into parts of the house with excessive moisture in air.

It is impossible as well as undesirable to remove all vapor from house interiors. However, vapor should not get into the insulation where it can be trapped and frozen. A vapor barrier or a water vapor proof surface on the warm side of the house wall will stop vapor from getting into the insulation. Most blanket and bat insulating materials come with a vapor barrier. This should always be installed toward the side that will be warm in winter. The rigid type of insulation is treated to resist water vapor. When fill insulation is used above ceilings, it can be protected from moisture by use of vapor proof paper between the joists before insulation is poured into place.

About the only way to provide a vapor barrier for walls or ceilings not originally vapor proofed is to remove any wallpaper or loose paint, then cover the plaster of the affected walls or ceilings with two coats of aluminum paint. This is a satisfactory procedure for houses already insulated where a moisture condition shows up on peeling paint and damp walls. The aluminum paint will not interfere with wall papering or painting surfaces for decoration purposes.



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It's Moth Time Even in January

Moths are hungry 12 months a year.

They breed rapidly in warm, dark places, and there are plenty of these in every home. Closets, upholstery under slipcovers, and rugs under chairs are dark all year round. And if you have central heating, your home may be as warm in January as it is in July—maybe warmer.

In any season, a moth worm can travel 64 feet in 8 hours, eating woolen clothing, upholstery and rugs as it goes! So it pays to declare open season on moths on a year-round basis. Moth-hunting isn't really difficult if you know the moth's habits. The powerful suction of your vacuum cleaner will dislodge moth eggs from floor coverings, and the cleaner's blowing action will force moth crystal vapor through rugs, clothing and blankets and into every closet corner.

You can use the upholstery or crevice tool attachment to de-moth rugs and furniture by blowing mothproofing vapor through the rugs, into the corners of upholstery and into furniture springs and webbing, too.

To De-Moth a Closet

Put moth crystals in the vacuum cleaner's mothproofing attachment in accordance with instructions which come with the cleaner. Place the cleaner on the closet floor and run it as a blower for 10 or 15 minutes until the crystals vaporize; then remove and seal the closet by stuffing newspapers under the door and running cellulose tape around the sides and top. Leave the closet sealed for 24 hours to give the vapor a chance to penetrate every corner for a complete de-mothing job.

You can lessen the danger of moth damage by following a few suggestions:

Keep your rugs free of such moth-gatherers as dust, lint and dirt by light daily vacuuming, thorough weekly cleaning and the exposure of rugs to light and air whenever possible. Remove spots immediately and de-moth the rugs twice a year.

De-moth furniture twice a year, too, and take off the slip covers once a month so that you can brush the upholstery and expose it to light and air.

Brush woolens frequently and vigorously, and give special attention to folds and pockets not usually exposed to light. Air woolens often and store only in containers which have been mothproofed and can be tightly sealed.

"I don't see why I should electrify this farm. Jim Hawkins, the man who had it before, didn't use any electricity, and he did all right, year after year, right up to the day he went bankrupt."

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SIZES
12—20
30—42

9095
SIZES
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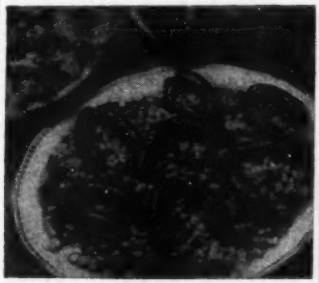
Send THIRTY CENTS (in coins) for EACH pattern to: ELECTRICITY ON THE FARM, Pattern Department, 243 West 17 Street, New York 11.
In Canada: 60 Front Street, Toronto, Ontario.

Sausage for Supper

Sausages, sizzling hot, are just right on a cold night. To pep up a casserole, try the savory links in combination with scalloped potatoes, Spanish rice, creamed macaroni, baked beans, creamed mixed vegetables, or Mexican corn. The mingling of the good sausage flavor with other foods is appetizing.

For most combination dishes, you'll want to pre-cook the sausage links before adding them to the casserole. Place the sausages and one-fourth cup water in a skillet. Cover. Heat and steam the sausage 5 or 6 minutes to cook through. Then pour off the liquid and brown lightly. This pre-cooking assures thorough cooking of the sausage, and it also develops the flavor of the meat.



Cook sausage for breakfast the same way. Pre-cook and steam the meat in water, then brown slowly and well. For a crowd, bake sausages in a hot oven (400°) about 30 minutes, using an open pan. Turn once to brown. Test sausage before serving by cutting into a link to see that there is absolutely no pinkness to the meat.

Sizzling sausages top succotash for a family supper dish pictured here. Add a dash of vinegar and a sprinkling of brown sugar for sweet-sour tang and have a different dish.

Sweet Sour Sausage With Succotash

4 servings

1 pound pure pork sausage links
1 No. 2 can red kidney beans
1 No. 2 can whole kernel corn
2 tablespoons vinegar
2 tablespoons brown sugar

Pan-brown sausage in a heavy skillet. Pour off fat. Add drained kidney beans and corn. Mix vinegar and brown sugar. Pour mixture over sausage and vegetables. Cook over low heat, stirring occasionally, until vegetables are hot. Serve immediately.

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for Junior Partners

Hi—

One train doesn't look much different from another as it goes speeding by. And the cars look pretty much alike, too. But there's a world of difference! I was in a little cubicle called a roomette. There, in a space about 4' x 7' was everything I needed. The seat was very comfortable and there was a large window through which I could watch the passing countryside. But I began to realize that I was getting an awfully one sided view of things. So I walked back through the train. At the back end I figured there'd be an observation car. There was, and I sat down. Being able to see out both sides of the car gave me a much better picture. But, walking back through the train, I had passed through a car such as I had never ridden in. It was a vistadome car that has a glass turret in the center. There are quite a few seats there and you can see in all directions—left, right, up, down, backward and forward. I went back and took a seat and, from now on, I'm going to make sure I walk the length of every train I ride. I want to be sure of getting a fair look in all directions. And I'm going to make sure that I apply the same process to my daily problems. When viewed from all sides, they're much easier to understand. Happy New Year!

Kenneth V. Anderson

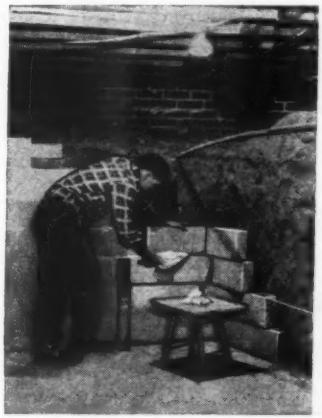
4-H Club Scholarships Awarded

Six of State Winners in Farm and Home Electric Program Receive Special Recognition

Six farm lads have won top national honors and $300 college scholarships for figuring out new and better ways for electricity to help do the work on the farm and in the home. The six rural "efficiency experts" were national winners in the Westinghouse 4-H Farm and Home Electric Program. The presentation took place at a banquet in the Conrad Hilton Hotel, in Chicago, where Gwilym A. Price, president of the Westinghouse Electric Corporation, made the awards.

Winners from 43 states and Puerto Rico—they included 35 boys and nine girls—attended the banquet as honored guests. Each of them, as a state winner, had been awarded a free trip to Chicago for the national 4-H Congress. The Westinghouse Educational Foundation, which is maintained by the Westinghouse Electric Corporation, provided the all-expense trips as well as the scholarships for the national winners. The six national awards bring to 93 the total number of scholarships presented by Westinghouse in its 17 years of cooperation with the 4-H program.

The six national winners join in demonstrating Charles Morrow's feed factory to Gwilym A. Price, extreme right, President of Westinghouse Electric Corp. From left to right, the winners are, kneeling, Horace D. Saunders, Murrell D. Kennedy, and Robert E. Wyatt. Standing, they are Joseph W. Pyle, Charles Morrow, feeding corn into machine, and Lowell D. Glenn.



With some help from his father, Chuck Morrow removed more than 150 tons of dirt from underneath the Morrow home to make way for a basement workshop. The dirt was loaded on a conveyor belt which carried it to the outside where it was hauled away in a neighbor's truck. The task involved laying the cinder block wall, cementing the floor, reinforcing with steel beams, building an outside stairway approach, and installing the wiring and lighting. Six months were required for the job.

The names of this year's national winners, with a short resume of their activities, follows:

Charles F. Morrow, 17-year-old national winner from Bessemer, Alabama. Honored as the outstanding 4-H'er of the area in 1951 by the Birmingham Chamber of Commerce, Charles is president of the Jefferson County 4-H Club Council and a sophomore at Bessemer High School. This year he built a

novel "feed factory" that shells corn from the cob and then grinds it for cattle feed, all in one operation. When he wanted a place for a workshop, he excavated a cellar under the house to make room for it and has wired the cellar for electricity. To show others the need for good wiring he built a demonstration panel on which a small model house begins to smoke, as though on fire, when the wires become overloaded. An all-around boy, Charles plays football, basketball and baseball at high school.

Lowell D. Glenn, 17, of Exeter, California, was a "city boy" with no knowledge of farm operations until he joined 4-H just five years ago. There was no local 4-H Club, so Lowell helped organize one. From an enrollment of eight members, it has grown to 35, winning the trophy for the most outstanding club in the country three years in a row. Lowell graduated from Exeter Union High School last year and now is a freshman at the University of California. As a part of his Farm and Home Electric project he built a table and an electric tool box that took first honors at the Tulare County Fair. He also installed a number of electrical outlets and switches, repaired lamp cords and wrote up a survey of electrical equipment in use in the home. He has served as a junior leader and assistant leader in his 4-H group.

Murell D. Kennedy, 16, of Almyra, Arkansas, lives on his parents' 800 acre farm and in seven years of 4-H work has participated in 63 projects which have produced an income of more than $7,300. In his electric project he improved his

Names and Addresses of 4-H Farm and Home Electric Program Winners

State	*Name of Winner*	*Address*
*Alabama	Charles F. Morrow	Bessemer, Rt. 3
*Arkansas	Murell D. Kennedy	Almyra, Rt. 2
*California	Lowell D. Glenn	Exeter, Box 145
Colorado	Howard L. Enos	Yoder
Connecticut	Duane F. Sweet	Oakdale, Rt. 1
Florida	Alton N. Higgins	Dade City, Rt. 1
Georgia	Sara Elizabeth Vickery	Hartwell, Rt. 3
Idaho	Dewaine E. Erickson	Genesee
Indiana	Donnie J. Brown	Milroy
Iowa	Charles Rauch	Mt. Ayr, Rt. 2
Kansas	Keith G. Swenson	Morganville
Kentucky	Anna Lee Stice	Brownsville
Louisiana	Margaret A. Wilmore	Boyce, Rt. 1
Maine	Percy M. Cunningham, Jr.	North Whitefield
Maryland	Harry A. Wessel	Laurel, Star Rt.
Massachusetts	William M. Aurnhammer, Jr.	Granby
Michigan	Richard W. Rowley	Ionia, Rt. 3
Minnesota	Dale K. Kelsey, Jr.	Lewisville, Rt. 1
Mississippi	Bettye S. Powell	Vardaman, Rt. 3
Missouri	Nelda M. Dalton	Advance, Rt. 1
*Montana	Horace D. Sanders	Kalispell, Somers Stage Rt.
Nebraska	Tom Neil Johnson	Nehawka, Rt. 2
Nevada	John Serpa	Fallon
New Hampshire	Clayton R. Bean	Lisbon
New Mexico	Jack E. Sadosuk	San Antonio
New York	Thomas E. Porteus	Oneonta, Rt. 1
North Carolina	Charles E. Woodall	Smithfield, Rt. 1
North Dakota	Earl D. Johnson	Maddock, Rt. 2
*Ohio	Robert E. Wyatt	Grover Hill, Rt. 1
Oklahoma	Bill Hine	Braman, Rt. 1
Pennsylvania	Harriett J. Adams	Avella, Rt. 2
Rhode Island	Laurence H. Perron	Tiverton
South Carolina	Carroll D. Johnson	Nesmith, Rt. 1
South Dakota	Alice Ann Brotherton	Forbes, *North Dakota*
Tennessee	Calvin L. Eads	Cleveland, Rt. 6
Texas	Ronald Ray Davidson	Big Spring, Rt. 1
Utah	Denzil C. Talbot	Lewiston
Vermont	Rupert C. Chamberlin	Barton, Rt. 1
Virginia	Martha P. Isaacs	Lynchburg, Rt. 5
Washington	James M. Hatley	Pullman, Rt. 2
*West Virginia	Joseph W. Pyle	Bethany, Rt. 1
Wisconsin	Richard J. De Moulpied	Caledonia, Rt. 1
Wyoming	Jerry R. Walter	Node
Puerto Rico	Francisco Vicens	Ciales

*Denotes National Winner

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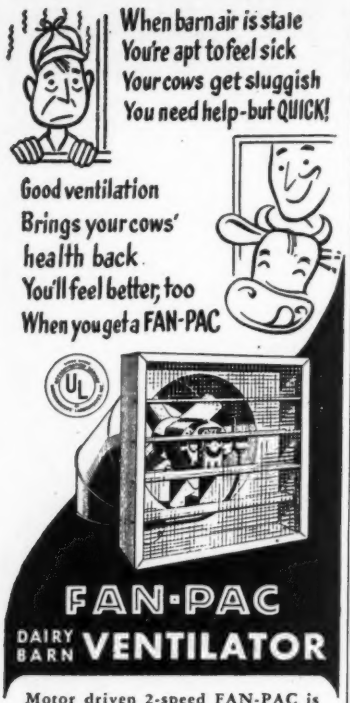
☐ Electromode Domestic Heaters
*Name*_____
*Address*_____
*City*_____



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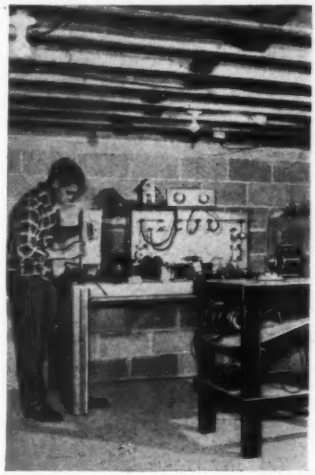
LIMITED SUPPLY
Full 8-Inch Genuine Machined Shears
Big heavy duty—cuts heavy and sheerest fabrics.
Send $1.98 plus 20c for Pkg. and postage or C.O.D. One to a customer.
DACO ELECTRIC CO., Dept. 34
932 Roscoe St., Chicago 13, Ill.

home water system, built an electric lawn mower from an old motor and mower, wired the brooder house, installed infrared light bulbs for the 200 chicks, and rigged up an electric fan to keep the potatoes cool in storage. A junior in DeWitt High School, Murell intends to make farming his career.

Joseph W. Pyle, 20-year-old electrical expert of Bethany, West Virginia, not only does a lot of electrical work but knows how to tell people about it. His lighting demonstration titled "Controlled Light for Economy and Sight" this year won county, regional and state championships. Twelve years in 4-H work, Joseph lives on a 104 acre farm and has made electrical repair work his forte. As part of his Farm and Home Electric project, he has wired the dairy barn, made extension cords, put in outlets, repaired electric motors, and made several lamps. Joseph was graduated from Bethany High School in 1950.

Horace D. Sanders, 20, has made electrical living possible on his parents' 320 acre farm near Kalispell, Montana. He completely wired the six-room house and installed a water pump for irrigation. He ran an underground electric line into the cellar, built an electric pig brooder and several lamps. A member and former president of the Flathead County 4-H Builders Club, Horace hopes to attend Montana State College and intends to make farming his life's work.

Robert E. Wyatt, 17, of Route 1, Grover Hill, Ohio, in addition to participating in a demonstration of "Safe Use of Electricity" at the Ohio State Fair this year, has put his electrical know-how to work on his parents' 180-acre farm. Thanks to his automatic water system, the hogs now can get a drink whenever they want one. His electrically driven grain conveyor carries grain to the back of the barn and drops it into bins automatically. A portable elevator carries the grain from the wagon to the conveyor which is powered by a one horsepower motor. Robert also has made many electrical repairs at home and for the neighbors. A senior at Grover Hill High School, he hopes to study engineering.



Here is Morrow's finished workshop. The ten-inch combination power saw, in the foreground, is some of Chuck's handiwork. At the bench he is preparing the winding for a ¼ hp motor. Always looking for new uses for electricity, Chuck has enough motors on hand for whatever gadgets and labor-saving devices he may dream up. The experience he's getting will be helpful in the future. He plans to have his own beef cattle farm, someday.

"I did a good job of clipping my 4-H heifer. I practiced first."

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Advice to a Growing Chick

It's a scientific world. Yes, little chicken, it is a wonderful, miraculous world. Certainly we are living in a time of progress and new developments.

We realize how your little brain must be baffled at the intricate workings of the gadget you are watching. It must be doubly difficult for you to understand the world in which you find yourself. Born of an incubator and brooded by heat lamps you have to figure it out for yourself. You've no Mamma or Papa to guide you.

But don't worry little chicken. Worry and stew and, sure as the world, you'll wind up a neurotic, inhibited and frustrated little bird. Go ahead and take a drink. Drink the trough dry. Science won't let you down. Empty the trough and as the spring pulls up the arm that holds the trough, a valve will open and a fresh drink will come squirting down for you to drink.

Science has placed here at your disposal an arrangement of springs, levers and valves. Back of the valve there is also a pipe and a pump. And whirling the pump that forces the water there are kilowatts of electric power.

Now let's not get too technical about how all these things work. Just go ahead and drink. You see, after all,

Yours is not to reason why
Yours is just to grow and die
And in passing leave behind
That well fed feeling with mankind.

H. Clapper

Home in Magic Valley

. . . . . (Here from page 18)

er capacity. Presently there are three breakers in reserve which can be used for future circuits.

Besides good wiring practices, meticulous usage is the second most important factor responsible for the low monthly consumption. The Richards do not believe in wasting electrical power, but at the same time they do use the electricity necessary to give them all the conveniences of electrical living. To support this statement Emil points out that free natural gas is available to them right on their farm. But since they are such stern believers in the convenience, safety, and economy of electrical power, none of this gas has ever been used.

The Richard home is truly an excellent example of electrical living. Any farmer with an eye to the future would do well to consider the practices followed by the Richards. Electricity on the farm is quite common today, but good electrical installations are still somewhat uncommon. Since the Richards seem to be a step ahead of most people with their electrical applications, the feather in Emil's hat may be rightfully justified.

Electronic Mama

In developing a synthetic sow's milk so that piggies may be taken from their mother 48 hours after birth so that Mama Pig can be freed to raise more litters faster, a scientist made up a tape recording on which was recorded the squeals of pigs of every age.

It was observed that the piggies would sleep for hours without eating, unless they were awakened by a squeal from one of their number.

With the squeals of the piggies taped on the recording machine, it is connected to an automatic timing device which turns the recording on at periodic intervals. Awakened by their own barnyard symphony, the orphan pigs rush to robot mama (a trough), and eat their fill. Net result is a substantial increase in their growth.

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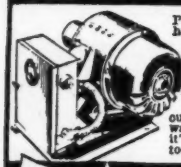
3050 Fourth Ave., So., Minneapolis 8, Minn.

KILL Power Failures



Protect your farm and home NOW with this low-cost stand-by generator that operates from tractor belt or gas engine. Complete with water-proof safety switch. Why wait until your lights go out, stoker, refrigerator, water, radio stops—then it's TOO LATE. Write today for full details.

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Turns virgin ground into a garden bed in one operation. Replaces plowing, discing, and cultivating. Women can operate it.

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Model P-3000
2 gals. cap. f.o.b. factory $37.50

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GRAND SHEET METAL PRODUCTS COMPANY
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Questions and Answers

Freezer Wiring

▶**Question:** *What special wiring is required when a freezer is installed?*

Mrs. R. E. M., Pennsylvania

▶**Answer:** A separate circuit should be provided from the entrance panel directly to the point where the freezer will be located. The size of wire and the voltage to use will be determined by the size of the refrigeration unit. Motors of ½ HP and up should be operated on 230 volt.

Electric Fence Precautions

▶**Question:** *We read of a child who touched an electric fence and died as a result. Was this faulty wiring?*

Mrs. E. M. L., Illinois

▶**Answer:** This was not necessarily due to faulty wiring. It was probably the fencer, itself, that was at fault. The human body cannot withstand strong electric currents. Children may be more susceptible than adults. The path which the current takes through the body has a great deal to do with its effectiveness. In view of these facts the Underwriter's Laboratories made exhaustive tests to determine safe current values. On the basis of these they set up standards which, if followed, enable a manufacturer to produce an electric fence free of hazards. All electric fencing units do not necessarily meet this standard. Those that do, carry the Underwriter's Laboratories seal of approval. Such a fence can be regarded as safe because it is so designed that its shocking current is held within the limits of safety. It is the only kind we would recommend.

Wiring Capacity

▶**Question:** *Can the same wire be used to supply current to a range, clothes dryer, and a water heater?*

Mrs. M. G., Ohio

▶**Answer:** The entrance cable to the home will supply current for all of the equipment you mention. However, where it enters the building this wire terminates in an entrance panel. Here feeder circuits to the different parts of the home are connected and each circuit is provided with protection against overload. Each major piece of equipment in the home should have its own circuit. You will need such a circuit for each of the three pieces of equipment you list.

Number of Outlets

▶**Question:** *Is there any set rule as to the number of outlets that each room should have?*

Mrs. L. J. H., Iowa

▶**Answer:** The National Electric Code recommends the use of one receptacle outlet for every 20 linear feet, or major fraction thereof, of the total distance around the room. In a room measuring 10 x 12 the distance around the room would be 44 feet. There should be four outlets in this room and they should be installed, insofar as is practicable, equal distances apart. For the small appliance loads in kitchen, laundry, pantry, dining room, and breakfast room of dwellings one or more branch circuits shall be provided for all receptacle outlets (other than those for clocks) in these rooms and such a circuit shall have no other outlet. These should be wired with #12 wire fused at 20 amperes.

Ground Wire Size

▶**Question:** *In wiring between buildings, is it necessary to use the same size wire for the ground leg as for the hot leg?*

D. A. B., Ohio

▶**Answer:** Not unless you have some local ordinance or Code covering the subject. The National Electric Code gives minimum standards for wiring. It lists the size of grounding conductor to be used for different capacities. Your local electrician can determine the proper size to be used.

Several Motors, One Circuit

▶**Question:** *Can several motors be run on the same circuit?*

Mrs. R. M., Illinois

▶**Answer:** Several small fractional horsepower motors may be operated on the same circuit. This should be a heavy duty circuit (#12 wire) fused at 20 amperes. Such fusing will not afford overload protection for the motor. Each motor so used should have its own individual overload protection built in. Motors larger than ½ HP should be operated on 230 volt, on their own individual circuit.

Farm Electrical Equipment Buying Guide

An index of Electric Farm Productive Equipment and Home Appliances available from the manufacturers who have been advertising in this magazine during the past year. For further information and name of your nearest dealer, write directly to these manufacturers, mentioning that you obtained their name from ELECTRICITY ON THE FARM *Magazine. They will be glad to help you.*

If you want information about equipment that is not included in this index, write to Reader Service Dept., ELECTRICITY ON THE FARM *Magazine, 24 W. 40th St., New York 18, N. Y.*

ALARMS, POWER-OFF
Automatic Electric Mfg. Co., Mankato, Minn.

BARN CLEANERS
Bodger-Northland, Inc., Kaukauna, Wisc.
Clay Equipment Co., Cedar Falls, Iowa
James Mfg. Co., Fort Atkinson, Wisc.
Patz Barn Cleaner Co., Pound, Wisc.
Starline, Inc., Harvard, Ill.

BATTERY CHARGERS
General Electric Co., Schenectady, N. Y.

BLOWERS, GRAIN
Hartzell Prop. Fan Co., Piqua, Ohio

BLOWERS, HAY
Hartzell Prop. Fan Co., Piqua, Ohio

BROODERS, LAMB
Steber Mfg. Co., Broadview, Ill.

BROODERS, PIG
James Mfg. Co., Fort Atkinson, Wisc.
Steber Mfg. Co., Broadview, Ill.

BROODERS, POULTRY, BATTERY
James Mfg. Co., Fort Atkinson, Wisc.

BROODERS, POULTRY HOVER
James Mfg. Co., Fort Atkinson, Wisc.

BROODERS, POULTRY, INFRARED
Infrared Brooder Mfg. Co., Manheim, Pa.
LML Engrg. & Mfg. Corp., Columbia City, Ind.
Steber Mfg. Co., Broadview, Ill.

CABLE, SOIL HEATING
General Elec. Co., Schenectady, N. Y.
Gro-Quick, Chicago 10, Ill.
Smith-Gates Corp., Plainville, Conn.

CHURNS
Alabama Mfg. Co., Birmingham 3, Ala.
Safgard Div., Grand Sheet M. P. Co., Chicago 8, Ill.

CLIPPERS, ANIMAL
Andis Clipper Co., Racine, Wisc.
Sunbeam Corp., Chicago 50, Ill.

CLIPPERS, HEDGE
Sunbeam Corp., Chicago 50, Ill.

COMPRESSORS, REFRIGERATION
Frigidaire Div., Gen. Motors Corp., Dayton, Ohio
Westinghouse Elec. Co., Mansfield, Ohio
Zero Mfg. Co., Washington, Mo.

COOLERS, EGG
Zero Mfg. Co., Washington, Mo.

COOLERS, MILK
DeLaval Separator Co., Poughkeepsie, N. Y.
Frigidaire Div., Gen. Motors Corp., Dayton, Ohio
Victor Prod. Co., Hagerstown, Md.
Westinghouse Elec. Co., Mansfield, Ohio
W. C. Wood Co., Ltd., Guelph, Canada
Zero Mfg. Co., Washington, Mo.

COOLERS, MILK, DROP IN
Frigidaire Div., Gen. Motors Co., Dayton, Ohio
Victor Prod. Corp., Hagerstown, Md.
Westinghouse Elec. Co., Mansfield, Ohio

COW TRAINERS
James Mfg. Co., Fort Atkinson, Wisc.

DEHORNERS, CALF
Sunbeam Corp., Chicago 50, Ill.

DE-ICERS, STOCK TANK
General Electric Co., Schenectady, N. Y.
Smith-Gates Corp., Plainville, Conn.
Westinghouse Elec. Corp., Pittsburgh 30, Pa.

DRIERS, CROP
Amer. Crop Drying Equip. Co., Crystal Lake, Ill.
Habco Mfg. Co., Columbus, Neb.
Martin Steel Products, Mansfield, Ohio

DRILLS, ELECTRIC PORTABLE
Albertson & Co., Sioux City 2, Iowa
Black & Decker Mfg. Co., Towson 4, Md.

ELECTRODES, WELDING
General Electric Co., Schenectady, N. Y.
Harnischfeger Corp., Minneapolis 8, Minn.
Westinghouse Elec. Corp., Pittsburgh 30, Pa.

ELEVATORS, PORTABLE CROP
James Mfg. Co., Fort Atkinson, Wisc.
LML Engrg. Mfg. Corp., Columbia City, Ind.

FANS, BARN VENTILATING
Amer. Mach. & Metals, Inc., E. Moline, Ill.
Clay Equipment Co., Cedar Falls, Iowa
Hartzell Prop. Fan. Co., Piqua, Ohio
Hunter Fan & Vent. Co., Memphis, Tenn.
Ilg Elec. Vent. Co., Chicago 41, Ill.
James Mfg. Co., Fort Atkinson, Wisc.

FANS, CROP DRYING
Amer. Crop Drying Equip. Co., Crystal Lake, Ill.
Amer. Mach. & Metals, Inc., E. Moline, Ill.
Clay Equip. Corp., Cedar Falls, Iowa
Hartzell Prop. Fan Co., Piqua, Ohio
Ilg Elec. Vent. Co., Chicago 41, Ill.

FANS, POULTRY HOUSE VENTILATING
Amer. Mach. & Metals, Inc., E. Moline, Ill.
Clay Equipment Corp., Cedar Falls, Iowa
Hartzell Prop. Fan Co., Piqua, Ohio
Ilg Elec. Vent. Co., Chicago 41, Ill.
James Mfg. Co., Fort Atkinson, Wisc.

FEEDERS, AUTOMATIC POULTRY
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FREEZERS
DeLaval Separator Co., Poughkeepsie, N. Y.
Frigidaire Div., Gen. Motors Corp., Dayton, Ohio
Kelvinator Div., Nash Kelvinator Co., Detroit 32, Mich.
Schaefer, Inc., Minneapolis 1, Minn.
Victor Prod. Corp., Hagerstown, Md.
Westinghouse Elec. Corp., Mansfield, Ohio

FANS, ATTIC VENTILATION
Amer. Mach. & Metals, Inc., E. Moline, Ill.
Hunter Fan & Vent. Co., Memphis, Tenn.
Ilg Elec. Ventilating Co., Chicago 41, Ill.

FANS, KITCHEN VENTILATION
Hunter Fan & Ventilating Co., Memphis, Tenn.
Ilg Electric Vent. Co., Chicago 41, Ill.
Westinghouse Electric Co., Mansfield, Ohio

FANS, PORTABLE
General Electric Co., Bridgeport 2, Conn.
Ilg Electric Vent. Co., Chicago 41, Ill.
Singer Sewing Machine Co., New York 6, N. Y.
Westinghouse Electric Corp., Mansfield, Ohio

FILTERS, IRON REMOVAL
Oshkosh Filter & Soft. Co., Oshkosh, Wisc.

FREEZERS, FARM FOOD
DeLaval Separator Co., Poughkeepsie, N. Y.
Frigidaire Div., Gen. Motors, Dayton, Ohio
General Electric Co., Louisville 2, Ky.
Hotpoint, Inc., Chicago 44, Ill.
Kelvinator Div., Nash Kelvinator Co., Detroit 32, Mich.
Revco, Inc., Deerfield, Mich.
Schaefer, Inc., Minneapolis 1, Minn.
Victor Prod. Corp., Hagerstown, Md.
Westinghouse Elec. Corp., Mansfield, Ohio

FRYERS, DEEP FAT
Sunbeam Corp., Chicago 50, Ill.

GRILLS
General Electric Co., Bridgeport 2, Conn.
Westinghouse Elec. Co., Mansfield, Ohio

HEATERS, PORTABLE
Burnham Corp., Irvington, N. Y.
General Electric Co., Bridgeport 2, Conn.
Singer Sewing Machine Co., New York 6, N. Y.
Westinghouse Electric Corp., Mansfield, Ohio

HEATERS, WATER
Clark Div., McGraw Electric Co., Chicago 38, Ill.
Fairbanks, Morse & Co., Chicago 5, Ill.
Frigidaire Div., Gen. Motors, Dayton, Ohio
General Electric Co., Louisville 2, Ky.
Hotpoint, Inc., Chicago 44, Ill.
Kelvinator Div., Nash Kelvinator Co., Detroit 32, Mich.
Monarch Malleable Range Co., Beaver Dam, Wisc.
Sepco Corp., Pottstown, Pa.
Westinghouse Elec. Co., Mansfield, Ohio

HEATING PADS
General Electric Co., Bridgeport 2, Conn.
Westinghouse Elec. Co., Mansfield, Ohio

HOT PLATES
General Electric Co., Bridgeport 2, Conn.
Westinghouse Elec. Corp., Mansfield, Ohio

IRONS, ELECTRIC
General Electric Co., Bridgeport 2, Conn.
Singer Sewing Machine Co., New York 6, N. Y.
Sunbeam Corp., Chicago 50, Ill.
Westinghouse Elec. Corp., Mansfield, Ohio

IRONS, STEAM
General Electric Co., Bridgeport 2, Conn.
Singer Sewing Machine Co., New York 6, N. Y.
Sunbeam Corp., Chicago 50, Ill.
Westinghouse Elec. Corp., Mansfield, Ohio

IRONERS
Frigidaire Div., Gen. Motors Corp., Dayton, Ohio
General Electric Co., Louisville 2, Ky.
Hotpoint, Inc., Chicago 44, Ill.

MIXERS, FOOD
General Electric Co., Bridgeport 2, Conn.
Kitchen Aid Div., Hobart Mfg. Co., Troy, Ohio
Singer Sewing Machine Co., New York 6, N. Y.
Sunbeam Corp., Chicago 50, Ill.
Westinghouse Elec. Corp., Mansfield, Ohio

MOTORIZING SET FOR SEWING MACHINE
Singer Sewing Machine Co., New York 6, N. Y.

RADIATORS, ELECTRIC
Burnham Corp., Irvington, N. Y.

RANGES—COMBINATION
Monarch Malleable Range Co., Beaver Dam, Wisc.

RANGES, ELECTRIC
Frigidaire Div., Gen. Motors Corp., Dayton, Ohio
General Electric Co., Louisville 2, Ky.
Hotpoint, Inc., Chicago 44, Ill.
Kelvinator Div., Nash Kelvinator Co., Detroit 32, Mich.
Monarch Malleable Range Co., Beaver Dam, Wisc.
Westinghouse Elec. Corp., Mansfield, Ohio

REFRIGERATORS
Frigidaire Div., Gen. Motors Co., Dayton, Ohio
General Electric Co., Louisville 2, Ky.
Hotpoint, Inc., Chicago 44, Ill.
Kelvinator Div., Nash Kelvinator, Detroit 32, Mich.
Westinghouse Electric Corp., Mansfield, Ohio

ROASTERS
General Electric Co., Bridgeport 2, Conn.
Westinghouse Electric Co., Mansfield, Ohio

SEWING MACHINES
Singer Sewing Machine Co., New York 6, N. Y.

SHAVERS
Electro Tool Corp., Racine, Wisc.
Sunbeam Corp., Chicago 50, Ill.

SINKS, KITCHEN
Frigidaire Div., Gen. Motors, Dayton, Ohio
General Electric Co., Louisville 2, Ky.
Hotpoint, Inc., Chicago 44, Ill.
Westinghouse Elec. Co., Mansfield, Ohio

SOFTENERS, WATER
Dayton Pump & Mfg. Co., Dayton, Ohio
Deming Co., Salem, Ohio
Fairbanks, Morse & Co., Chicago 5, Ill.
F. E. Myers & Bro. Co., Ashland, Ohio
Oshkosh Filter & Soft. Co., Oshkosh, Wisc.

TIMERS
Paragon Elec. Co., Two Rivers, Wisc.

TOASTERS
General Electric Co., Bridgeport 2, Conn.
Singer Sewing Machine Co., New York 6, N. Y.
Sunbeam Corp., Chicago 50, Ill.
Toastmaster Pdts. Div., McGraw Elec. Co., Elgin, Ill.
Westinghouse Elec. Co., Mansfield, Ohio

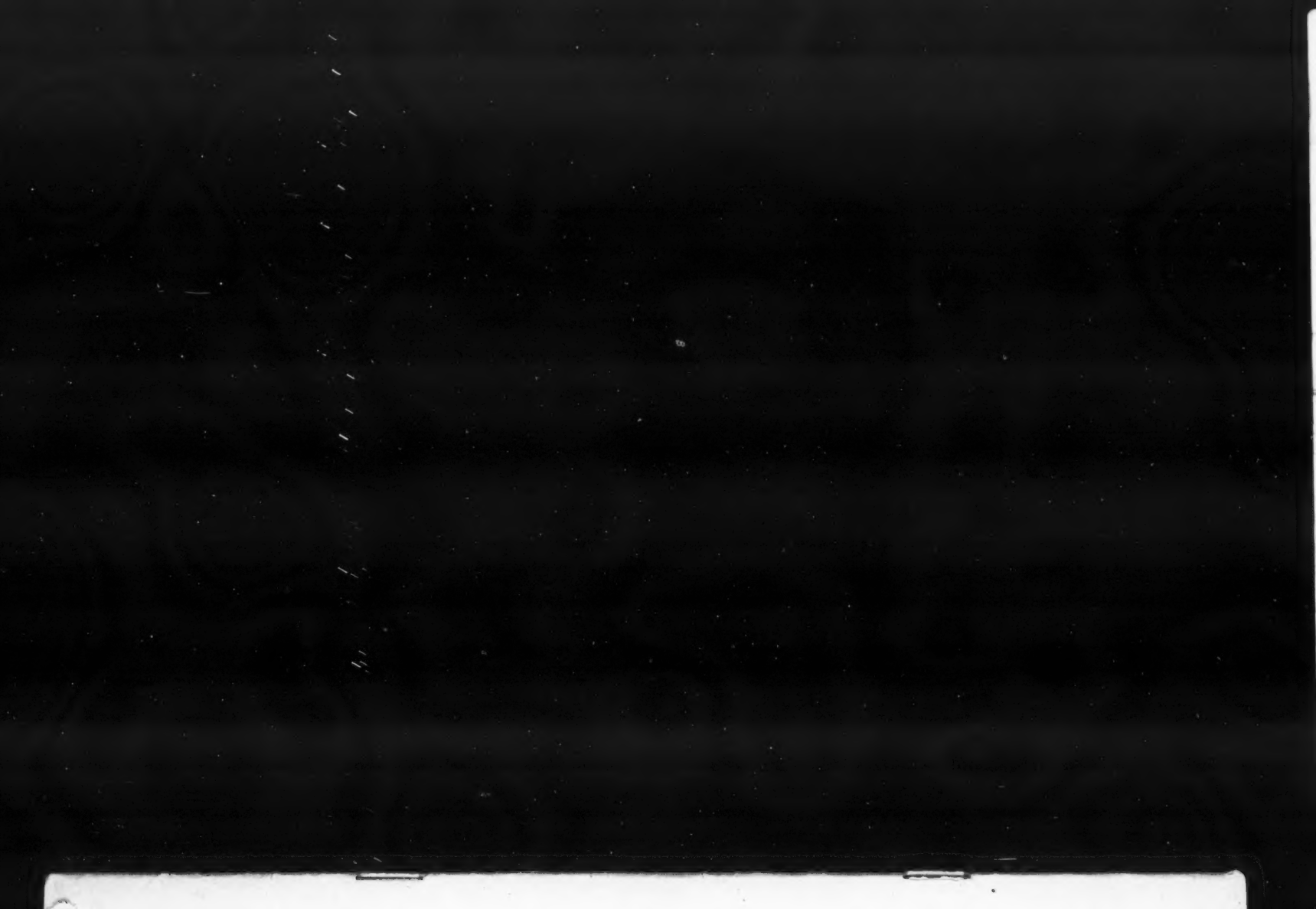
VACUUM CLEANERS
General Electric Co., Bridgeport 2, Conn.
Singer Sewing Machine Co., New York 6, N. Y.
Westinghouse Elec. Corp., Mansfield, Ohio

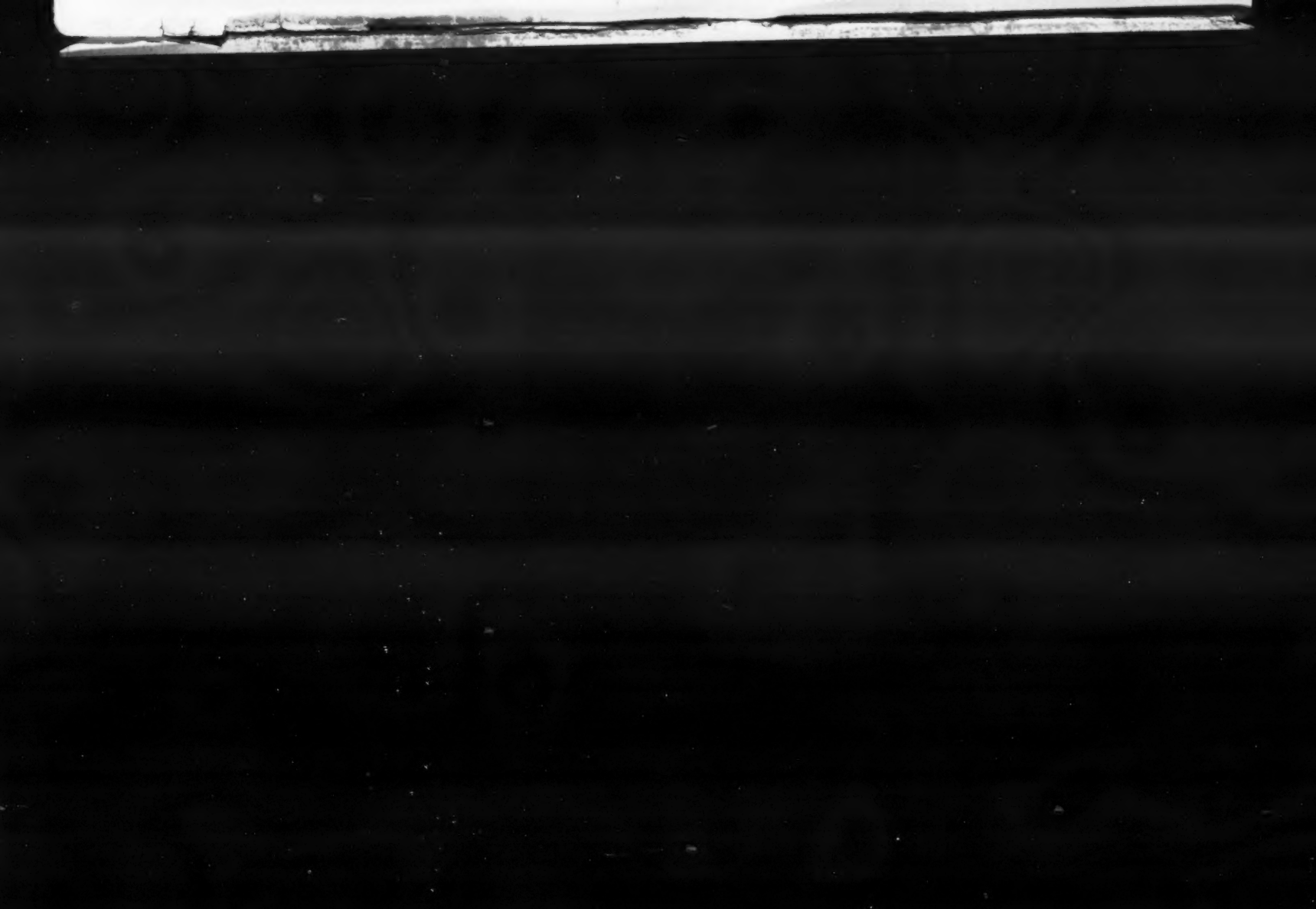
WAFFLE BAKERS
General Electric Co., Bridgeport 2, Conn.
Sunbeam Corp., Chicago 50, Ill.
Westinghouse Elec. Corp., Mansfield, Ohio

WARMERS, BABY BOTTLE
Sunbeam Corp., Chicago 50, Ill.

WASHERS, CLOTHES
Fairbanks, Morse & Co., Chicago 5, Ill.
Frigidaire Div., Gen. Motors, Dayton, Ohio
General Electric Co., Louisville 2, Ky.
Hotpoint, Inc., Chicago 44, Ill.
Westinghouse Elec. Corp., Mansfield, Ohio

WATER CLOSETS, FROST PROOF
Joseph A. Vogel Co., Wilmington, Del.





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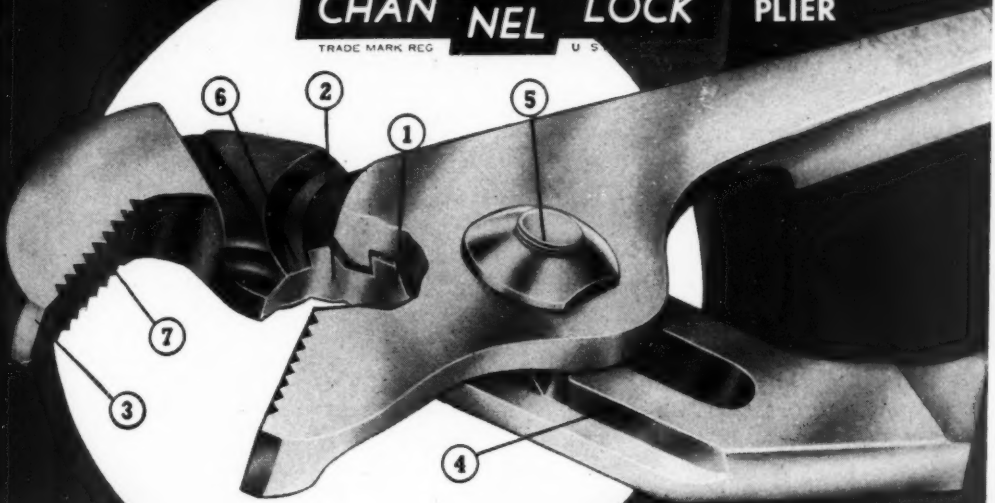
THE NEW No. 420

CHAN NEL LOCK PLIER

TRADE MARK REG U S



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1. Interlocking principle prevents slippage under any load . . . the heavier the job, the greater the interlocking action.
2. New type wide base jaw provides maximum cross section strength . . . cannot wear.
3. New nose design provides greater utility for gripping small objects.
4. Patented design of tension edge provides more strength and eliminates stress concentration at channels.
5. New interlocking design minimizes stress on joint bolt.
6. Precision machined interlocking surfaces provide perfect fit, thus distributing pressure evenly.
7. "Rite Angle" teeth guarantee maximum bite and minimum wear.

Here's the new, improved Channellock Plier—bringing to you new features which offer more positive gripping, greater strength and longer wear. The undercut interlocking channel is the first really new idea in plier design in years. Engineering skill has developed a plier with new patented features which give you the newest, strongest, most practical plier you can buy. Here is a plier that will last for years! Channellock Pliers—made only by Champion DeArment Tool Co., Meadville, Pa.

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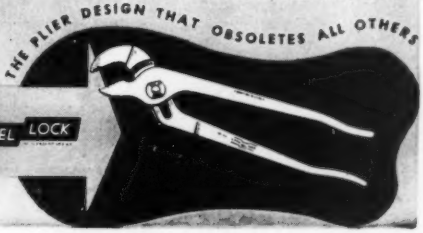
THE PLIER DESIGN THAT OBSOLETES ALL OTHERS



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